# *Two in Nature – One in Substratum: An Aristotelian Metaphysical Model for Ontologically Dependent Entities*

**Anna Marmodoro**

**Ph.D.**

**The University of Edinburgh**

**2006**

I declare that this text is my own work, it was entirely composed by me, and it has not been submitted for any other degree or professional qualification.

Candidate's signature Edinburgh, 26/04/06

**Abstract**

My research topic is the ontology of causation in Aristotle, with a view to also making a contribution to contemporary philosophy. I offer a new interpretation of Aristotle's account of causation and perception.

I argue that Aristotle understands the *causal link* in terms of a *single* complex entity which involves essentially *two* interdependent natures (e.g. an activity that grounds teaching and learning). Internally, such an entity has the same metaphysical structure as a line that grounds two vectors with opposite directions. But the causal entity, as opposed to the line and vectors, is itself ontologically dependent on the two substances that are in causal interaction. This is because the entity's two natures are the realisation of two interdependent potentialities of the two substances (e.g. for teaching and learning).

Aristotle builds a causal bridge between substances out of mutually realised potentialities of the two substances. Their mutual realisation binds them together into a net of ontological dependencies which delineates the boundary of the causal entity. In my thesis I describe the multifarious ontological dependencies and argue that Aristotle has made a unique contribution to the history of the analysis of causation by offering an ontological account of it in terms of *potentiality-actuality* and *ontological dependence*.

Furthermore, Aristotle puts to use his theory of causation to account for the metaphysical status of what we call after Locke secondary properties, e.g. colours, sounds etc. I reconstruct Aristotle's theory of secondary properties in the light of my understanding of his two-in-one metaphysical model. I put Aristotle's theory of causation as applied to his theory of perception to the test of whether it gives philosophical gains in contemporary philosophy in the field of the philosophy of mind. I engage with David Chalmers' arguments against Primitivism – which is a new contemporary account of the metaphysics of colours. Primitivism is the account of colours philosophically most alike to Aristotle's own one. I put forward my own original position on the metaphysics of colours inspired by Aristotle's theory of causation, arguing for the core Primitivist assumptions, while avoiding Chalmers' criticisms.

**Acknowledgements**

It gives me great pleasure to acknowledge and express my gratitude for the support I enjoyed from different sources during my doctoral research years in the Philosophy Department of the University of Edinburgh. These years have been the most precious to me for the education and the training I was so fortunate to receive in preparing myself to enter the profession.

Two papers have resulted from my doctoral thesis, one published in the *American Philosophical Quarterly*, and the other submitted to the *Oxford Studies for Ancient Philosophy*. My article 'It's a Colourful World' in the *American Philosophical Quarterly*, 43:1, pp. 71-80 (2006) draws material from chapter 6 of my thesis. My article 'The Oneness of Cause and Effect in Aristotle: *Physics* III 3' submitted to the *Oxford Studies in Ancient Philosophy* draws material from chapter 5.

Other parts of my thesis have been presented at the following academic conferences, where I have been a main speaker: the Northern Association for Ancient Philosophy (2004), the International Reading Group on Ancient Philosophy, Delphi (2001 and 2004), the Scottish Reading Group for Ancient Philosophy meeting (2004), the International Conference on Metaphysics and Biology in Aristotle, Italy (2004), the Oxford Philosophy Graduate Conference (2003), the Scottish Philosophy Postgraduate Association (2003). I also gave presentations on material from my thesis in departmental seminars and workshops, and in particular I benefited from feedback received at the Work-in-Progress seminar in which I gave presentations at different stages of my research.

I would not have been able to achieve these results without all those who devoted some of their time to teach me how to engage with philosophical questions. I owe much gratitude to my supervisors: Dr Andrew Mason and Dr Thomas Johansen. But I also owe much gratitude to several other members of my Department who supervised me on particular issues I deal with in my thesis. I am

grateful to Dr Nudds, Dr Kail and Dr Ridge for their guidance in my research on the topic of perception and secondary qualities in Aristotle and in the contemporary philosophy of mind (chapter 6), and to Prof Scaltsas and Prof Holton on the topic of causation in Aristotle and in contemporary metaphysics (chapter 5). I also received comments in different occasions on the whole thesis and on my papers by many other members of my department and the Classics Department, and in particular from Dr Hermann. My thanks for constructive detailed criticism on various parts of the thesis also extend outside the University of Edinburgh to: Prof Allan Bäck, Prof Sarah Broadie, Prof David Chalmers, Dr David Charles, Prof Richard Patterson, Prof Tim Williamson.

My studies have been funded by many institutions which I thankfully acknowledge. I was the recipient of: the Jane Finlay Memorial Scholarship, awarded by the British Federation of Women Graduates (2003); Il Circolo Scholarship, awarded by Il Circolo – Associazione Culturale Italiana, London (2003); a Small Project Grant Award, awarded by the Development Trust of the University of Edinburgh (2002); the Bruce of Grangehill Award for Philosophical Achievement, awarded by the Department of Philosophy of the University of Edinburgh (2002); the Premier Studentship, awarded by the Faculty of Arts of the University of Edinburgh (2000, renewed in 2001, and 2002), the Faculty of Arts Targeted Studentship awarded by the Faculty of Arts of the University of Edinburgh (2000, declined in favour of the Premier Studentship).

**Table of Contents**

**The Argument of the Thesis: the Puzzle of Two Essences in One Substratum**

My thesis' project originates from the puzzlement and disagreement I discovered exist among Aristotelian scholars regarding the metaphysical analysis Aristotle gives of how causal powers are realised.

Imagine a world where causal activity gives birth not just to the effect, but to the cause as well; where a cause depends for its existence on its effect. If you have found yourself in unfamiliar territory, this is Aristotle's world. Aristotle holds that one cannot be teaching if no one is learning. Being a teacher is as much of an achievement of the causal interaction as being a learner. Also, the colour green being manifested on an object's surface is as much of an achievement of the object-perceiver causal interaction as the perceiver's experience of seeing green. These achievements (colour manifestation, and colour experience) are multifariously mutually dependent. But they belong to different subjects (i.e. the object is green and the perceiver experiences green) which are in causal interaction.

Aristotle's position on causation is a metaphysical puzzle that sets a challenge to ancient philosophy scholars. The challenge of solving this puzzle is my thesis research project.

What makes Aristotle's position on causation so puzzling is that for him a causal activity involves *two* natures grounded in *one* single activity. This seems, *prime facie*, at odds with Aristotle's own non-relativistic metaphysics, which allows only one essence per substance Nevertheless, the textual evidence in the *Physics* and in the *De Anima* is uncontroversial and describes causal activities precisely as such a type of 'entity', which I call 'two-in-one'.

My first step in tackling the problem is to understand what generates our metaphysical puzzlement with two-in-one entities. In **chapter 1** of my thesis I establish that two-in-one entities violate one of the most fundamental principles in

Aristotle's metaphysics, namely that the number of an entity goes hand in hand with the number of its essence. Substances are for Aristotle paradigms of things that are one in number and one in essence. I verify that the one essence – one substance principle is consistently present in Aristotle's conception of substance, from its origins in the *Categories* all along to its development in *Metaphysics* V 8, and then to the central books of the *Metaphysics*, in particular in VII 2 and 3. By contrast, the metaphysical novelty of two-in-one entities is that they bring about the divorce of the number of the essence and the number of that in which the essence is instantiated. In order to shed light on Aristotle's extraordinary departure from his own 'standard' metaphysical view, I contrast two-in-one entities with substances by analysing *Met* V 8, which is a pivotal text for understanding Aristotle's principles of substancehood, but has not received until now as much exegetical attention as other *loci classici* in Aristotle's *Metaphysics*.

There is also another dimension to the novelty of two-in-one entities, which is that in the history of realist metaphysics before Aristotle there is no record that any other thinker had thought of divorcing the number of a substance from the number of the principle of substancehood, however this principle was conceived. Hence, the question of what type of entity two-in-one entities are and of what type of ontological unity they enjoy open a new path of investigation in Aristotelian scholarship.

Two-in-one entities require a metaphysical account that nowhere Aristotle fully spells out and that has to be reconstructed from his most fundamental metaphysical principles regarding what it is to be a certain type of thing, what it is to be one, what it is to be the same with, and to be different from, something else. Chapter 2, 3 and 4 of my thesis are devoted to the investigation of these principles. In particular, **chapter 2** addresses the question of what the number of an entity is, namely what makes something into *one* entity. The most relevant text where to investigate this topic is *Met* V 6, where Aristotle sets out the various criteria for *oneness* he employs in his metaphysics. The investigation of the question of what the number of an entity is gives us the understanding of a range of possible Aristotelian criteria in play for accounting for the oneness of two-in-

one entities. (I will subsequently argue, in chapter 5, that it is the criterion of having a common material substratum that grounds the claim to oneness of two-in-one entities.)

I then turn to examine the question of the *twoness* of two-in-one entities. Two-in-one entities comprise different beings, or natures, which are ontologically interdependent and require a mutual process of realisation. But the potentialities for the two natures belong, respectively, to two different substances, the agent and the patient of the causal activity, and so do, in consequence, the two natures themselves. **Chapter 3** deals with the question of what the *being* of an entity is, and revolves around the examination of *Met* V 7, which is the chapter in Aristotle's *Metaphysics* devoted to the topic of being. I put forward a realist interpretation of the classification of beings in *Met* V 7, by contrast with the traditional interpretation according to which Aristotle sets out there different uses of the verb 'to be'. **Chapter 4** is an examination of the various criteria for sameness and difference Aristotle gives in *Met* V 9 and X 3, in order to gain understanding of what Aristotle means by saying that the two natures involved in two-in-one entitites are *different* in being, and yet have *one and the same* actuality.

Equipped with the understanding of three key questions regarding the number, the being, and the sameness / difference of entities, I argue in **chapter 5** that there is a solution to the puzzle of two-in-one entities. With reference in particular to *Phys* III 3 and *De An* III 2, I reconstruct the metaphysical model that grounds two-in-one entities. I claim Aristotle uses this model to give a metaphysical account of all causal activities. From one point of view, a causal interaction consists in two objects realising two properties they possess in potentiality; from another point of view, the properties' mutual realisation establishes a bond between the two objects; this metaphysical bond is a physical activity process which is essentially characterised by two natures. Thus causation for Aristotle is a (bonding) entity that comprises an underlying activity that grounds two essential natures.

Finally, in **chapter 6** I argue that Aristotle makes use of the two-in-one model in his theory of perception to give a philosophically sound account of the secondary properties such as colours and sounds as real properties of the objects, and yet dependent for their full realisation on being perceived by the perceiver. Aristotle's subtle realism about secondary qualities is not only of historical exegetical interest, but also relevant to the contemporary debate in the philosophy of mind. Among the contemporary theories of perception, *Primitivism* is in many respects a return to Aristotle's theory. I put Aristotle' account of secondary qualities to the test of the philosophical challenges that *Primitivism* has to address today, focussing in particular on the ontology of colours. I conclude by proposing my own account of the ontology of colours, which I call *Constitutionalism*. *Constitutionalism* retains the fundamental Aristotelian insights that *Primitivism* also preserves, but without being vulnerable to the arguments that have been moved against *Primitivism* most notably by David Chalmers.

# Chapter 1: Principles of Substancehood

## 1. Early conceptions of substance Aristotle inherits from his predecessors

There are two well-known chapters of the *Metaphysics* in which Aristotle gives an overview of other thinkers' doctrines about substance. These are *Met* V 8 and VII 2. The two texts deal with the same topic, but considered from two different perspectives.[1]

In *Met* VII 2 Aristotle reconstructs the *status quaestionis* on the investigation on substance at his time, in terms of the principles of substancehood that had been offered by some of his predecessors and by his contemporaries. Aristotle himself does not make any critical comment there on the received opinions he reports, nor does he include in the chapter his own views on substance. Rather, it is in *Met* VII 3 that he engages critically, as I will argue later, in showing the inadequacy of Plato's conception of substance and in putting forward his own position as a solution to the difficulties he finds with the Platonic one.

By contrast with *Met* VII 2, in *Met* V 8 it is my contention that Aristotle is not merely reporting other thinkers' views on substance; indeed, this is where the difference in perspective with *Met* VII 2 lies. Nor is *Met* V 8 a dialectical discussion of those views, in contrast for example with *Met* VII 3. Both the philosophical jargon and the conceptual tools Aristotle uses all throughout *Met* V 8 to explain the different conceptions of substance offered by other thinkers are very typically Aristotelian, as I will show through a detailed analysis of the text. I shall argue that in *Met* V 8 Aristotle is making a transition from received opinions of his time on substance, some of which which he endorsed himself at an earlier point of his investigation, to new developments in his own position, which shall be more fully discussed in the central books of the *Metaphysics*. In *Met* V 8 we see Aristotle's conception for substance in the making, so to speak, in contrast but also partially in continuity with other conceptions that were available to him. Hence, *Met* V 8 represents a crucial bridge between different moments of Aristotle's investigation on substance.[2]

---

[1] I take no position here about the relative chronology between *Met* VII 2 and V 8. A recent study on the relative chronology of the various books of the *Metaphysics* in relation to other parts of Aristotle works is Dumoulin's (1986).

[2] The suggestion that *Met* V 8 represents a bridge between different stages of Aristotle's investigation about substance is made also by Irwin (1988: 554-5).

In order to see the difference in perspective between *Met* V 8 and VII 2, let us first examine the content, the structure and the mode of presentation in *Met* VII 2. The chapter may be divided into four sections. In the first section, 1028b8-13, Aristotle reports the opinion that substances are the physical bodies: e.g. living beings, plants, their parts, the four elements, the universe and the stars. The second section, 1028b16-8, is devoted to the view that substances are the bodies' limits, namely surface, line, point and unit. The third section, 1028b18-27, is about the position, attributed to Plato, Speusippus, and Xenocrates, according to which there are substances over and above the sensible ones. The fourth section, 1028b27-32, is programmatic: Aristotle stresses the necessity of evaluating his predecessors' positions before proceeding with his own investigation. The first and the third sections of *Met* VII 2 are the most relevant for establishing a contrast of perspective with *Met* V 8. In the opening lines of *Met* VII 2, in close correspondence with V 8, Aristotle mentions that according to the most common opinion substances are: the natural bodies (τὰ φυσικὰ σώματα) corresponding to the simple bodies (τά τε ἁπλᾶ σώματα) in V 8;[3] plants and living beings corresponding to bodies in general and living things in V 8; and the parts of the sky corresponding to the stars in V 8.

In *Met* V 8, 1017b13-4, it is clear that for something to belong to the first class of substances, the physical bodies, it has to satisfy the criterion of being a subject (ὑποκείμενον), namely something of which everything else is predicated, and it is itself never predicated of anything. From now on, I shall refer to this criterion as the *subjecthood principle*, which I shall discuss in the following sections.

*Subjecthood Principle:*

> ἅπαντα δὲ ταῦτα λέγεται οὐσία ὅτι οὐ καθ' ὑποκειμένου λέγεται ἀλλὰ κατὰ τούτων τὰ ἄλλα.
>
> All these are called substance because they are not predicated of a subject but everything else is predicated of them.

[3] The terms φυσικὰ and ἁπλᾶ are used in this case as synonimous. See e.g. *Phys* IV 1, 208b8-9.

The very same items mentioned as examples of substances in *Met* V 8 appear also in *Met* VIII 1, 1042a5-12, and in *De Caelo* III 1, 298a29-33.[4] In *Met* VII 2 and *De Caelo* III 1 however physical substances do not appear to be for Aristotle intimately associated with being a subject (ὑποκείμενον).

In *Met* VIII 1 Aristotle lists once again the most commonly held views on substance at his time, but there he immediately adds, at 1042a12-3, that substance is the essence and ὑποκείμενον – which interpreters consider to be his own position.[5]

These remarks already offer some initial ground in support of the reading I propose for *Met* V 8; the subjecthood principle is genuinely Aristotelian, for it is employed in many other contexts in which Aristotle gives his own conception of substance. But in *Met* V 8 it is used to identify entities that are substances not for Aristotle but for other thinkers. More examples of this sort will be given in the course of the analysis of the whole chapter.

It is illuminating to compare *Met* V 8 with the opening of VII 3, 1028b33-6, where Aristotle prefaces his own investigation on substance by recalling four items which are thought to have a claim to being substance: essence, universal, genus and the substratum. It is an open question whether Aristotle intends to refer there to views held by other thinkers, or by himself, or both. There is evidence in some passages of his logical works that Aristotle has thought of the genus and the universal as substances.[6] But in the beginning of *Met* VII 3 Aristotle seems just to give a brief survey of well known accounts of substance of his time.

---

[4] *Met* VIII 1, 1042a5-12: 'Those generally recognized are the natural substances, i.e. fire, earth, water, air, etc., the simple bodies; second plants and their parts, and animals and the parts of animals; and finally the physical universe and its parts; while some particular schools say that Forms and the objects of mathematics are substances'. *De Caelo* III 1, 298a29-33: 'As substances I class the simple bodies-fire, earth, and the other terms of the series-and all things composed of them; for example, the heaven as a whole and its parts, animals, again, and plants and their parts'.

[5] *Met* VIII 1, 1042a12-3: 'But there are arguments which lead to the conclusion that there are other substances, the essence and the substratum'. Here the essence and the substratums seem to count as two distinct accounts of substance, but in a later passage in the same chapter, 1042a24-31, Aristotle treats them as extensionally coincident, for he says that in the case of sensible substances, matter, form (i.e. the essence) and the composite are all substrata: 'But now let us resume the discussion of the generally recognized substances. These are the sensible substances, and sensible substances all have matter. The substratum is substance, and this is in one sense the matter (and by matter I mean that which, not being a 'this' actually, is potentially a 'this'), and in another sense the formula or shape (that which being a 'this' can be separately formulated), and thirdly the complex of these two, which alone is generated and destroyed, and is, without qualification, capable of separate existence; for of substances completely expressible in a formula some are separable and some are separable and some are not'.

[6] From an Aristotelian point of view, the genus may be thought to be substance because it is what best expresses the essence of something, along the lines of what Aristotle writes in *Top* VI 5; the universal may be thought to be substance because it is what is best knowable. See *Top* VI 5, 142b22-9: 'The

In *Met* VII 3, after the initial lines just discussed, we find Aristotle's exposition of his own view on substance, which is further developed throughout the central books of the *Metaphysics*. For the sake of mapping *Met* V 8 onto an ideal reconstruction of the development of Aristotle's doctrine of substance, I distinguish, in broad strokes, three stages in his investigation. In the first one, corresponding to his logical works, Aristotle characterises substance as the ultimate subject of all predications but also as substance-of-something else, namely as essence. In the second stage, corresponding to *Met* V 8, Aristotle reconstructs the *status quaestionis* on the investigation into substance, including in it both his own philosophical insights and the ones received from other thinkers. As a result of this examination, he concludes that no current account of substance is satisfactory. In the third stage, he returns to his initial intuitions that substance is the ultimate subject (which he explores and further develops in *Met* VII 3), and that substance is the essence of something (which he develops in *Met* VII 4-6).

Let us turn now to a detailed examination of *Met* V 8. The majority of commentators agree that *Met* V 8 is articulated into five sections: the first four correspond to different accounts of substance, and the last one is a recapitulation of the contents of the chapter. The chapter is traditionally regarded as having four parts: 1) 1017b10-4: substances are physical bodies; 2) 1017b14-6: substance is the cause of being of something; 3) 1017b17-21: substance is the limit of a body; 4) 1017b22-3: substance is the essence of something; 5) 1017b23-6: conclusion.

More recently however new interpretative suggestions have been put forward. For instance, Duminil and Jaulin (1991: 187) assume that the final section is a recapitulation of what has been said in the chapter, but note that there Aristotle mentions only two accounts of substance, namely substance as subject and substance as form. From this they conclude that in the previous part of the chapter we should look for two, and not four, accounts of substance. They offer two ways of reading the chapter.

On the first reading they offer, substance as ultimate subject of predication is the topic of the first section, and substance as form is the topic of the second section. In the second section Aristotle deals with three aspects of what it is to be

---

genus is meant to indicate just this [namely, what something is], and is submitted first of the terms in the definition' (quote abridged). On this passage from the *Topics*, see also Sainati (1968: 91-7).

substance in the sense of form (rather than three distinct accounts of substance), namely being the immanent cause of being for something (1017b14-6); being the limit (i.e. what determines) of something (1017b17-21); and being the essence of something. Duminil and Jaulin find support for this interpretation in the use Aristotle makes of particular formulas of transition for the different parts of the text. They note that at 1014b14 we read ἄλλον δὲ τρόπον, which they claim separates the two main accounts of substance given in the chapter; while at 1017b17 and 21 we read ἔτι, which they take to express continuity in the exposition of three aspects of the second account of substance. However, without attempting any broad generalisation, *contra* Duminil and Jaulin I find throughout *Met* V evidence pointing to the opposite reading of the expressions ἄλλον δὲ τρόπον and ἔτι. (I will come to this point below, p. 21).

On the second reading Duminil and Jaulin offer Aristotle investigates two main accounts of substance at the same time, one of substance as ultimate subject of predication and the other as form as stated above, and the two accounts are in fact distinguished only in the conclusion. In the section 1017b10-6 the investigation is about the sensible substances, *qua* ultimate subjects of predication (e.g. the simple bodies, the composites, their parts, at 1017b10-4) and *qua* forms (namely what is the immanent cause of something else's being, at 1017b14-6). In the other section, 1017b21-2, the investigation is about the definition of substance, both of its parts (1017b17-21) and of the substance itself as a whole (1017b21-22). But, *contra* Duminil and Jaulin this reading clearly appears superimposed on the text and the qualifications introduced in their interpretation of the section 1017b10-6 ('*qua* ultimate subjects of predication' and '*qua* forms') are not in Aristotle's text.

An alternative reading of the structure of *Met* V 8 is offered by Dubois (1998: 73-80) who argues that the chapter consists in Aristotle's attempts to answer the question τί ἐστίν in relation to material beings. Dubois sees the chapter as divided into four sections: 1) 1017b10-4; 2) 1017b14-21; 3) 1017b21-2; 4) 1017b23-6.

In the first section, 1017b10-4, for Dubois Aristotle is investigating two aspects of what it is to be a substance, namely being the subject of the predication of accidents and being a composite with material parts. In the second section he is investigating what the immanent principles are that make a substance be what it is. The investigation there leads Aristotle to the account of substance of any given thing

as the cause of its being – which Dubois understands as the conditions for the existence of that thing (1017b14-6), and to the account of substance as form or essence – which is for Dubois the principle of individuation of things. Dubois' reasoning appears to be as follows: the principle of individuation is that in virtue of which each thing is what it is and what distinguishes one thing from the other, and this is for Aristotle the form of something, which is in *Met* V 8 identified with the external physical limit of the thing. Then the third section of the chapter, 1017b21-2, is for Dubois a brief summary of the section immediately preceding, 1017b14-21. There for Dubois the expression τὸ τί ἦν εἶναι refers to the cause of being of something and hence to its conditions of existence, while the expressions λόγος and ὁρισμός refer back to the limit and its function of being principle of individuation. Finally, the fourth section, 1017b23-6, for Dubois is a recapitulation of the whole chapter in which Aristotle highlights the two main accounts he offers for substance, which are being an ultimate subject and being the form of something. With regard to the account of substance as being the form of something, Dubois takes Aristotle to specify in the final recapitulation, first, that the form of something is what we cognize about that thing, and second, that the form is the actuality of the substantial composite. Dubois sees these two last points expressed in the final line of the chapter: τοιοῦτον δὲ ἑκάστου ἡ μορφὴ καὶ τὸ εἶδος, where μορφὴ alludes to the intelligibility and εἶδος to the actuality of forms. I disagree with Dubois' reading of the chapter. For not only is his interpretation not substantiated by what Aristotle actually says (in particular Dubois reads too much into the last line of the chapter, and does not offer any argument in support of his reading). His reading is unnatural, superimposed on the text, and nowhere does it take into account the actual transition formulas that Aristotle uses (e.g. at 1017b21 ἔτι clearly suggests the transition to another item in the discussion, whilst Dubois takes it as the introduction of a conclusive remark). Later on, in section 2 of this chapter I will also question the assumption that Dubois and Duminil and Jaulin share, among other commentators, about the fact that the very last part of *Met* V 8, corresponding to 1017b23-6, is a conclusive summary of the preceding part of the chapter. I will argue, *contra* the traditional interpretations, that the very last part of the chapter is in fact Aristotle's own account of substance.

## 1.1 Substance is physical body

The first principle of substancehood Aristotle discusses in *Met* V 8 is found in the section 1017b10-4. First Aristotle gives examples of things that on this principle are substances, at 1017b10-4, and then spells out the principle according to which the aforementioned items are substances, at 1017b13-4:

> Οὐσία λέγεται τά τε ἁπλᾶ σώματα, οἷον γῆ καὶ πῦρ καὶ ὕδωρ καὶ ὅσα τοιαῦτα, καὶ ὅλως σώματα καὶ τὰ ἐκ τούτων συνεστῶτα ζῷά τε καὶ δαιμόνια καὶ τὰ μόρια τούτων· ἅπαντα δὲ ταῦτα λέγεται οὐσία ὅτι οὐ καθ' ὑποκειμένου λέγεται ἀλλὰ κατὰ τούτων τὰ ἄλλα.
>
> Substances are: the simple bodies, which are to be understood as the four elements; the bodies that are constituted by the four elements, namely physical bodies, e.g. living beings, stars and planets; their material parts.

Two preliminary textual remarks are in place here. The use of ἁπλᾶ σώματα to mean the four elements is documented by Bonitz (*Index* 76b15-9). The meaning following expression ὅσα τοιαῦτα is rather less clear and has been discussed by the commentators. E.g. Ross (1997: I, 310 and II, 226) believes Aristotle wants to refer to different species of fire, water, air and earth, on the grounds of what Aristotle says in *De Caelo* I 2, 268b26-9:

> Ἐπεὶ δὲ τῶν σωμάτων τὰ μέν ἐστιν ἁπλᾶ τὰ δὲ σύνθετα ἐκ τούτων (λέγω δ' ἁπλᾶ μὲν ὅσα κινήσεως ἀρχὴν ἔχει κατὰ φύσιν, <u>οἷον πῦρ καὶ γῆν καὶ τὰ τούτων εἴδη καὶ τὰ συγγενῆ τούτοις</u>). (My emphasis).
>
> Bodies are either simple or are compounded of such; and by simple bodies I mean those which possess a principle of movement in their own nature, such as fire and earth with their kinds, and whatever is akin to them.

Ross's suggestion is however difficult to make sense of, and most importantly in other places in Aristotle's works there is evidence that he rules out the possibility that there may be different species of e.g. water. See *Top* I 7, 103a18-23:

> ἅπαντα γὰρ τὰ τοιαῦτα συγγενῆ καὶ παραπλήσια ἀλλήλοις ἔοικεν εἶναι. πᾶν μὲν γὰρ ὕδωρ παντὶ ταὐτὸν τῷ εἴδει λέγεται διὰ τὸ ἔχειν τινὰ ὁμοιότητα· τὸ δ' ἀπὸ τῆς αὐτῆς κρήνης ὕδωρ οὐδενὶ ἄλλῳ διαφέρει ἀλλ' ἢ τῷ σφοδροτέραν εἶναι τὴν ὁμοιότητα, διὸ οὐ χωρίζομεν αὐτὸ τῶν καθ' ἓν εἶδος ὁπωσοῦν λεγομένων. (My emphasis).
>
> For all such things seem to be of one family and to resemble one another. For the reason why all water is said to be specifically the same as all other water is because of a certain likeness it bears to it, and the only difference in the case of water drawn from the same spring is this, that the likeness is more emphatic: that is why we do not distinguish it from the things that in one way or another are called 'the same' in view of unity of species.

In conclusion, it seems best to read ὅσα τοιαῦτα in *Met* V 8 as a loose expression, intended to take the preceding statement to a higher level of generality, meaning that substances are the four elements in general and not just the ones explicitly mentioned in the text.

The next item in the list of substances that Aristotle gives has also been much debated by the interpreters: this is the physical bodies in general and the composites. Among the ancient commentators, Alexander of Aphrodisias (*In Met* 373, 4-5) notes that in this passage in *Met* V 8 living beings are reduced metaphysically to aggregates of the four elements. Alexander rightly points out that this is clearly a position Aristotle himself would not hold. And Alexander is committed in his interpretation to the assumption that *Met* V 8 in its entirety is an exposition of genuinely Aristotelian views. Alexander's way out of the difficulty his assumption generates is to interpret Aristotle's words to the effect that substances are either physical bodies, or what *has* a body (i.e. it is constituted by matter) and hence is not to be identified with a body.

Finally, again on the literal reading of the text, the ancient and medieval commentators have found difficulties in interpreting the word δαιμόνια, which clearly Aristotle here uses to refer to the celestial bodies. Alexander of Aphrodisias

(*In Met* 373, 5-8) shows awareness of the fact that in different grammatical forms this term may mean different things: in the masculine plural it refers to divine beings which have a body and a soul; in the neutral plural it refers to the celestial bodies. However, the later commentators, e.g. Aquinas, having lost direct knowledge of the ancient Greek, understand that Aristotle is actually referring to divine beings, gods of some sort, or possibly effigies of gods.[7] Paul of Venice, relying on the commentaries on Aristotle by Aquinas and Albert the Great, expands on the first of Aquinas' suggestions that δαιμόνια are gods of some sort by referring to the Platonic doctrine which has a place for those beings in the hierarchy of divines creatures. Paul also elaborates Aquinas second suggestion that δαιμόνια might be objects of devotion by commenting that this type of devotion was practised by the Peripatetics.[8] Clearly these medieval readings do not capture what Aristotle meant to say. It is only subsequently in the XIXth century with Bonitz and Schwegler that a good literal reading of the text is regained.[9] Bonitz (*In Met* 243; *Index* 164a20-23) quotes the opening of *Met* V 8 precisely to exemplify the use of δαιμόνια for celestial bodies, and shows that δαιμόνια is to be taken as synonymous of ἄστρα on the ground of e.g. *Phys* II 4, 196b6-7 where the two terms are used in a hendiadys. He also offers further confirmation from *De Caelo* I 2, 269a30-2, where the celestial bodies are said to be divine.

With a clear understanding of the literal meaning of the passage, we can turn now to the question of whether the substances mentioned as such in the beginning of *Met* V 8 are indeed substances on Aristotle's view, or rather in mentioning those substances Aristotle refers to a conception of substance different from his own.

---

[7] Aquinas *In Met* lib V lec 10, 241 [898]: "Et daemonia', idest idola, quae in templis posita colebatur pro diis. Vel daemonia dicit quaedam animalia rationabilia secundum Platonicos, quae *Apuleius* sic definit: Daemones sunt animalia corpore aerea, mente rationalia, animo passiva, tempore eterna'.

[8] Paul of Venice *In Met* ff. 70rb-va **M**, 182ra **Pv**: 'Quinymmo et daemonia, que apud Platonicos animalia aerea vocabatur, mente rationalia, iuxta diffinitionem Apulei, sic dicentis: 'demones sunt animalia corpore aerea, mente rationalia, animo passiva, tempore eterna', licet secundum veritatem non sint talia animalia, neque talia aerea corpora intellectum habentia. Apud autem Peripateticos dicuntur templorum ydola importantia compositionem artis ex substantia et figura una cum intellectu, conferente oracula atque consilia. Daymon enim in greco sonat in latino 'intellectum''. For one of the sources of Paul's interpretation see Albert the Great *In Met* lib V, tr 2°, c 5, 241: 'Et iuxta hoc dicuntur etiam substantiae *daemonia. Daimon* autem in Graeco in Latino sonat intellectum. Hic autem ponitur pro idolo; unde alia translatio habet idola, quod dicit substantiam compositam in arte'.

[9] See also Schwegler (1847: III, 215), who confirms that δαιμόνια is commonly used for celestial bodies, as we find evidence e.g. in Plato: 'Von δαιμόνια gibt Alexander zwei Erklarungen, von denen die zweite die richtigere ist: δαιμόνια τὰ θεῖα λέγει· τοιαῦτα γὰρ τὰ ἄστρα καὶ τούτων μήρη, Schol. 701, b, 19...Auch Plato...stellt τὰ δαιμόνια und τὰ θεῖα zusammen, z. B. Apol. 27 E'.

In *Met* VII 16 for instance Aristotle explicitly denies that parts of living beings and the four elements, mentioned in V 8, are substances; they are rather substances in potentiality, as it clear from 1040b5-15:

> Evidently even of the things that are thought to be substances, most are only potencies, both the parts of animals (for none of them exists separately; and when they are separated, then too they exist, all of them, merely as matter) and earth and fire and air; for none of them is a unity, but as it were a mere heap, till they are worked up and some unity is made out of them (quote abbreviated).

Let us first assume as a working hypothesis the position that many commentators have taken especially in late antiquity and in the middle Ages, namely that in the very first part of *Met* V 8 Aristotle is indeed presenting one of his own conception of substance. *Prima facie* passages like the one just quoted from *Met* VII 16 directly clash with this interpretation. One possible solution to this apparent inconsistency in Aristotle's work is to think of there being different conceptions of substance at different stages of an 'ideal' development of Aristotle's doctrine. Alexander of Aphrodisias (*In Met* 373, 11-5) and Asclepius (*In Met* 319, 11-2) are the first to suggest that the view on substance that is put forward at the beginning of *Met* V 8 belongs to an earlier stage in Aristotle's thought, before the central books of the *Metaphysics*, and very close to the *Categories*.[10]

Alexander of Aphrodisias offers an interesting suggestion to bridge *Met* V 8 and the *Categories*.[11] In *Met* V 8 Aristotle mentions as substances parts of material bodies, and even their material constituents (i.e. the four elements). Alexander of Aphrodisias expresses concern on how is it possible in Aristotelian terms that they all count as substances. He finds as a solution that they are substances on the ground that they are indivisible (ἄτομον) and numerically one according to the criterion of indivisibility derivable from *Cat* 5, 3b10-13, (on which see also section 2 of this chapter):[12]

---

[10] See Alexander *In Met* 373, 14-5; Asclepius *In Met* 319, 12; Averroes *In Met* lib V tr 1° c 8 p 118r 15D; Albert the Great *In Met* lib V tr 2° c 5 p 241; Aquinas *In Met* lib V lec 10 p 241 [898]; Paul of Venice *In Met* ff 70va **M**, 182ra **Pv**.

[11] It is striking that Alexander seems not to be concerned with the apparent contradiction between *Met* VII 16 and V 8 on the issue that parts of animals are simple elements.

[12] For other occurrences of the term ἄτομον with same meaning as in the passage quoted above, see also *Cat* 2, 1b5-6 and 3a38; also Bonitz *Index* 120a48-53.

Πᾶσα δὲ οὐσία δοκεῖ τόδε τι σημαίνειν. ἐπὶ μὲν οὖν τῶν πρώτων οὐσιῶν ἀναμφισβήτητον καὶ ἀληθές ἐστιν ὅτι τόδε τι σημαίνει· ἄτομον γὰρ καὶ ἓν ἀριθμῷ τὸ δηλούμενόν ἐστιν.

> Every substance[13] seems to signify a certain 'this'. As regards the primary substances, it is indisputably true that each of them signifies a certain 'this'; for the thing revealed is individual [my translation: indivisible] and numerically one.

In fact, in this first section of *Met* V 8 Aristotle himself does offer a criterion to explain why physical bodies, their parts, and even the elements, and this is at 1017b13-4 the linguistic criterion according to which substances are ontological entities that are picked out by those terms that are the subjects of every predications, not themselves predicated of anything. This is the *Subjecthood Principle* (mentioned above). This criterion appears *verbatim* in many other passages of Aristotle's works: in the *Categories*, in the *Metaphysics*, in the *Physics*.[14]

In order to understand the significance of the use of this criterion in *Met* V 8 I shall devote the next section to the analysis of its occurrence in *Met* VII 3. The reason why the analysis of *Met* VII 3 is of crucial importance to the current discussion is that there, I argue, Aristotle presents an application of the principle performed by his predecessors that for Aristotle leads to absurd consequences. This is because in Aristotle's view the principle by itself is necessary but insufficient for picking out what is truly substance, and needs to be combined with other criteria that something has to satisfy to count as a substance.

At the beginning of *Met* VII 3, 1028b33-7, we find three candidates for what substance is: matter, form and the compound. The three of them appear to satisfy the definition of substance as ultimate subject. Granted for the sake of argument, Aristotle tells us, that the subjecthood principle is indeed satisfied by all the three candidates, the next question to address is which candidate best qualifies as a substance. As the investigation proceeds in the second part of the chapter, 1029a10-26, the application of the subjecthood principle leads to what is maximally

[13] Here I take substance to mean 'name of substance' as suggested by Ackrill (1963: 88).
[14] See e.g. *Cat* 5, 2a11-3; 2b15-7; 2b37-3a1; 3a37; *Met* VII 3, 1028b36-7; 1029a1-2; 1029a8-9; VII 13, 1038b15; *Phys* I 2, 185a32. Other occurrences are mentioned in Bonitz *In Met* 243.

indeterminate, namely the matter, as the best candidate for substancehood. For Aristotle this result is however inadequate (οὐ ἱκανόν), unclear (ἄδηλον), and ultimately impossible (ἀδύνατον). From these result Aristotle concludes that the subjecthood principle expresses only a necessary but not sufficient condition that something has to satisfy to count as substance. What I want to highlight for the time being on the ground of this sketchy presentation of *Met* VII 3 is the following: Aristotle himself makes use of the subjecthood criterion as a condition that something needs to satisfy in order to count as a genuine substance. However, clearly in *Met* VII 3 Aristotle does not even consider the possibility that the subjecthood principle could lead to the identification of the physical bodies as substances, by contrast with *Met* V 8.

The provisional conclusion I want to suggest, which will be corroborated by further arguments in the course of the detailed analysis of *Met* V 8, is that the subjecthood principle is genuinely Aristotelian, but the results it leads to in *Met* V 8 are not, and not any more than the results it leads to in *Met* VII 3 are. In the former case it leads to the physical bodies as substances, in the latter to matter as substance; neither of the two is a position Aristotle wishes to endorse.

On the interpretation I suggest, the tensions that emerge in the first section of *Met* V 8 between what Aristotle says there and his position is in other parts of his works, is to be understood as generated by Aristotle's attempt to account for other thinkers' views through his own conceptual tools. An example of the tensions I refer to is the following. On the subjecthood principle, substances are not predicated of anything else. But at least some of the substances actually mentioned in the first section of *Met* V 8, the simple bodies, are said to be material constituents of something else; hence they are predicated of the composite they are constituents of. But this is an apparent inconsistency.[15]

[15] In fact for Aristotle the material constituents of something – as they enter into the constitution of that thing – are re-identified by the form of the thing they constitute, and could not possibly retain their own form, as it is argued e.g. in *Met* VII 7, 1033a16-23: 'And so, as there also a thing is not said to be that from which it comes, here the statue is not said to be wood but is said by a verbal change to be wooden, not brass but brazen, not gold but golden, and the house is said to be not bricks but bricken (though we should not say without qualification, if we looked at the matter carefully, even that a statue is produced from wood or a house from bricks, because coming to be implies change in that from which a thing comes to be, and not permanence). It is for this reason, then, that we use this way of speaking'. See also *Met* IX 7, 1049a18-27.

### 1.2 Substance is the cause of being

On the second account of substance in *Met* V 8, 1017b14-6, substance is said to be 'cause of being':

> ἄλλον δὲ τρόπον ὃ ἂν ᾖ αἴτιον τοῦ εἶναι, ἐνυπάρχον ἐν τοῖς τοιούτοις ὅσα μὴ λέγεται καθ' ὑποκειμένου, οἷον ἡ ψυχὴ τῷ ζῴῳ.
>
> [We call 'substance'] that which, being present in such things as are not predicated of a subject, is the cause of their being, as the soul is of the being of an animal.

In the passage just quoted we find a terminology that is typically Aristotelian. It is not a characterisation of substance that Aristotle would find adequate to express his own views on substance. Nevertheless it is open to interpretation whether Aristotle is just reformulating in his own terms a position held by other thinkers or expressing his own view; and in the latter case whether it is a view that he has held himself at some earlier stage of his investigation on substance before the central books of the *Metaphysics*.

Those commentators, in late antiquity and in the Middle Ages, who believe that Aristotle is giving his own account of substance find puzzling that in this section of *Met* V 8 there is no mention of the soul as form or essence. It is a tenet in Aristotle's metaphysics that what is cause of being for something is the form or essence of that thing; the soul is so defined e.g. in *Met* VII 10, 1035b14-6, and in *De An* II 1, 412a19-21, but not in *Met* V 8. In order to overcome this difficulty for the interpretation he supports, Alexander of Aphrodisias for example justifies the fact that Aristotle does not mention in the *Met* V 8 passage what we could call his 'standard' definition of the soul as the formal cause of the living being in the following way. He suggests that in *Met* V 8 Aristotle wants to emphasise that the soul plays the role of the immanent cause of being peculiar to living beings; hence it is a sensible and en-mattered form (ἔνυλον εἶδος).[16] Alexander's point is however not persuasive, for three reasons.

[16] Alexander *In Met* 373, 21-5: ὅσα δὴ ἐνυπάρχοντα ταῖς οὐσίαις αἴτιά ἐστιν αὐταῖς τοῦ εἶναι αἵ εἰσι, ταῦτα καὶ αὐτὰ οὐσίας λέγεσθαι. εἴη δ' ἂν λέγων τὰ τῶν φύσει συνεστώτων εἴδη, ταῦτα

Firstly, in the actual Aristotelian text there is no indication that the soul is treated by Aristotle as a special type of form. Secondly, Alexander's suggestion presupposes the hylomorphic analysis of substance that Aristotle develops in the central books of the *Metaphysics* and does not seem to have already available in *Met* V 8. The notion of substantial forms which are the cause of being of substances, and the merging of matter and form in the constitution of substance are themes that Aristotle introduces rather in *Met* VII 17. In a more correct perspective, the position Aristotle takes in the central books of the *Metaphysics* can be seen as anticipated to some degree in book V, but not presupposed. Alexander fails to see that even if the view on substance expressed in this part of *Met* V 8 were genuinely Aristotelian, yet, it would have to be located at an earlier stage of investigation than the one to which Alexander sees it as belonging. Thirdly, *contra* Alexander in the central books of the *Metaphysics* the attribution of substantial form to matter modifies it metaphysically and re-identifies it. The re-identification of matter by the substantial form is Aristotle's metaphysical solution to avoid that two forms survive in the same matter thereby undermining the unity of the substance. Alexander, in suggesting that the soul is a ἔνυλον εἶδος does not consider that for Aristotle this would be a threat to the unity of substance.

A more promising line of interpretation seems to be that according to which in *Met* V 8 we find an early Aristotelian view on substance. This line first of all assumes that the first two sections of the chapter, up to1017b16, are to be read jointly, on the basis of the linguistic observation that this section of the chapter is introduced by the expression ἄλλον δὲ τρόπον, while the others begin with ἔτι. On this line of interpretation this stylistic variant indicates that the first and the second section of the chapter are closely connected, while the following sections introduce different items of discussion (by contrast with Duminil and Jaulin, who claim the expression ἄλλον δὲ τρόπον separates the two main accounts of substance given in the chapter, namely substance as ultimate subject of predication and substance as form. See above p. 10)

Reading the first two sections together, the first part of *Met* V 8 is to be taken as a reconstruction of the development of Aristotle's own early doctrine of substance. In the first place, corresponding to 1017a10-4, substances are the physical bodies;

---

δὲ ἐστι τὰ φυσικὰ καὶ ἔνυλα εἴδη, ὁποῖόν ἐστιν ἐν τοῖς ζῴοις ἡ ψυχή· διὰ γὰρ ταύτην ζῷα. καὶ ἐπὶ τῶν φυσικῶν δὲ σωμάτων τὸ εἶδος ἑκάστῳ αἴτιον τοῦ εἶναι ὅ ἐστιν.

subsequently, at 1017b14-6, substance is the soul, for it is the cause of being of physical bodies. On this interpretation, *Met* V 8 is an intermediate stage of the investigation on substance, to be located – conceptually – in between the *Categories* and the central books of the *Metaphysics*. In the *Categories* the so called primary substances are merely the ontological items that correspond to the ultimate subjects of predication at the linguistic level. There is agreement among commentators that in the *Categories* the primary substances are primitive, not further analyzable items[17] that cannot be predicated of anything else (but only in so called unnatural predications where the logical subject does not coincide with the grammatical subject of the proposition). Hence, the first set of substances given in *Met* V 8 fits well within the *Categories* framework; whilst in the second section of *Met* V 8 Aristotle appears to discern a more complex internal structure in the substance, whereby a substance has in itself the cause of its being. This is a step forward from the *Categories* doctrine towards the central books of the *Metaphysics* doctrine, and especially *Met* VII 17.[18]

The interpretation just presented raises a series of questions. Is the soul an ultimate subject? If it is, and yet it is something different from the living being as a whole, should we take it to be a part of the living being? How can Aristotle account for something substantial being in a substance, as the soul is said to be in the living being, and yet trying to preserve the substantial unity of the living being?

A starting point for addressing these questions is to be found in *Met* V 18, 1022a29-32, where Aristotle says:

> Whatever attribute a thing receives in itself directly or in one of its parts; e.g. a surface is white in virtue of itself, and a man is alive in virtue of himself; for the soul, in which life directly resides (ἐν ᾗ πρώτῃ τὸ ζῆν [ἔστιν]), is a part of the man.

There Aristotle claims that the property of 'being alive' is a property *per se* of 'man' for it belongs primarily to the soul, which is a part of man. For the point I wish

[17] Loux (1991: 35ff) has explored in depth this point in Aristotle's theory of substance and captures it in the so called Unanalyzability Thesis: there are primary entities, whose 'what it is' has to be understood as not reducible to anything conceptually prior, hence it is not further analyzable.

[18] See also *Met* VIII 2, 1043a2-4: 'It is clear, then, from these facts that, since its substance is the cause of each thing's being, we must seek in these differentiae what is the cause of the being of each of these things'.

to make it is relevant to look at the series of equivalences Aristotle posits in *Met* V 18 between what is expressed by the formulas: 'that in virtue of which' (καθ' ὅ), 'in virtue of itself' or *per se*' (καθ' αὐτὸ) and 'cause'. Aristotle says that the expression 'that in virtue of which' has as many senses as the term 'cause' (1022a19-20) and its senses correspond to the senses of the expression '*per se*' (1022a24-5). It follows that the expression '*per se*' has as many senses as the expression 'cause'. On the basis of this equivalence, each of the senses of the expression 'that in virtue of which' and '*per se*' can be taken to express a causal relation between the ontological items corresponding respectively to subject and predicate in a proposition. In particular, if that in virtue of which something is what it is, is in some sense its first recipient (1022a16-17), then the first recipient is also that to which the properties of that thing belong *per se* (see also 1022a29-32 quoted above). In the light of these remarks, we can now understand that in the example in *Met* V 8, 1027b16, and in V 18, 1022a32, the soul is that in virtue of which a living being is alive, hence it is the cause of being of the living being, for it is the first recipient of the property of being alive, namely it is that to which the property belongs *per se*.

On this interpretation one is also able to explain why the account of substance as cause of being in *Met* V 8 is mentioned immediately after the account of substance as ultimate subject. What is the cause of being of something else, like e.g. the soul, is also an ultimate subject in the sense that it is the first recipient to which the essential properties in virtue of which something is what it is belong *per se*.

### 1.3 Substance is the body's limits

The next conception of substance Aristotle presents in *Met* V 8 is given at 1017b17-21: substances are the bodies' limits,[19] which are characterised as present in the bodies, circumscribing the bodies, and thereby determining them (i.e. making them be something determinate):

> ἔτι ὅσα μόρια ἐνυπάρχοντά ἐστιν ἐν τοῖς τοιούτοις ὁρίζοντά τε καὶ τόδε τι σημαίνοντα, ὧν ἀναιρουμένων ἀναιρεῖται τὸ ὅλον, οἷον ἐπιπέδου σῶμα, ὥς φασί τινες, καὶ ἐπίπεδον γραμμῆς· καὶ ὅλως ὁ ἀριθμὸς δοκεῖ εἶναί τισι τοιοῦτος (ἀναιρουμένου τε γὰρ οὐδὲν εἶναι, καὶ ὁρίζειν πάντα)·
>
> [We call 'substance'] the parts which are present in such things, limiting them and marking them as individuals, and by whose destruction the whole is destroyed, as the body is by the destruction of the plane, as some say, and the plane by the destruction of the line; and in general number is thought by some to be of this nature; for if it is destroyed, they say, nothing exists, and it limits all things.

To address the question whether this account of substance is to be taken as genuinely Aristotelian or not I shall first make some remarks concerning the position Aristotle takes on this view of substance in other passages of his works.

In book IV of the *Physics* Aristotle engages in a critical discussion of the hypothesis that the bodies' limits are their forms, and so *qua* forms they are

---

[19] Aristotle does not use in this passage the term we would expect for limit, i.e. πέρας, but it is clear that this is what he referring to, also by comparison with other passages in which the same model for substance is described, e.g. *Met* XIV 3, 1090b5-7 and *Phys* IV 8, 209b1-5. The term μόρια to refer to mathematical and geometrical entities as substances appears to be used here by Aristotle loosely, as the commentators have noticed. See e.g. Alex *In Met* 373, 27-9; Albert the Great *In Met* lib. V, tr. 2°, c. 5, p 241; Ross (1924: I, 310); Duminil-Jaulin (1991: 189). Alexander of Aphrodisias for instance notes that the limits of bodies described as parts without any further qualification are ambiguous and could be understood as parts of the extension of the body; but that would not be the right way to take it, as it is clear e.g. in the case of surfaces. Alex *In Met* 373, 27-31: λέγει δὲ οὕτω τὰ πέρατα τῶν σωμάτων οὐσίας καὶ αὐτὰ λέγεσθαι, μέρη καὶ μόρια κοινότερον εἰπὼν αὐτά, ὡς ὄντα τῶν τοῦ σώματος διαστημάτων μέρη· οὐ γάρ ἐστιν ἡ ἐπιφάνεια μέρος τοῦ σώματος οὕτως ὡς διαιρεῖσθαι εἰς αὐτήν· τοῦ μέντοι λόγου αὐτοῦ μόριόν ἐστι, καὶ ταύτῃ ὁρίζεται τὸ σῶμα. ὁμοίως δὲ καὶ ἡ γραμμὴ πρὸς τὴν ἐπιφάνειαν ἔχει.

substances. The conclusion he reaches in *Phys* IV 2 is a *reductio ad absurdum* of the hypothesis that the place of something, being what primarily contains and circumscribes the body, is therefore its limit and also its form. In *Phys* IV 4, 211b10-14, Aristotle also argues that the place, being what contains and delimits the body, seems to be its form, and there seems to be an equivalence between place, limit and form, but this is not correct, for place is the limit of the containing body not of the contained one. In both cases Aristotle takes into consideration, but finally rejects, the hypothesis that the limit of something (or more precisely the place of something as its limit) is the form of what it is limit of. This gives us reason for not attributing to Aristotle the model on which the body's limit is its substance, in the sense of being its form.

Aristotle has reasons for being interested in exploring the possibility of the limit being the form of the body. In the context of the *Physics* it is a sound assumption that a body is merely an extended entity, whose matter is by definition the interval of a magnitude. On this assumption what defines the interval of the magnitude, namely what makes it a determinate magnitude, is the form of the body. On the basis of this consideration there is ground for the hypothesis that the place of a body, by circumscribing the body's extension in space, is also its form. But from Aristotle's point of view the physical properties that characterise a bodily substance cannot be reduced to geometrical properties. What defines geometrically a substance does not express exhaustively also its physical characteristics, therefore cannot be its form.

The various other passages in which Aristotle returns to the position that the bodies' limits are substances are within the framework of his refutation of Platonic and Pythagorian doctrines. For example, he gives arguments against the claim that lines are substances either in the sense in which the form of something is its substance or in the sense in which the matter is in *Met* XIII 2, 1077a31-6,[20] and also in *De Caelo* III 1, 299a2-6, and in *GC* II 1, 329a21-4, and attributes the position to Plato.[21] Another example is in *Met* XIV 3, 1090b5-13, where he argues against the

[20] *Met* XIII 2, 1077a31-6: 'How can lines be substances? Neither as a form or shape, as the soul perhaps is, nor as matter, like the solid; for we have no experience of anything that can be put together out of lines or planes or points, while if these had been a sort of material substance, we should have observed things which could be put together out of them'. See also Annas (1976: 146).

[21] See e.g. *Tim* 53C-55C.

Pythagorians' claim that the physical bodies are constituted by numbers, which for Aristotle runs into the contradiction of deriving what has weight from what is neither heavy nor light.[22]

With these considerations on the background, we can now turn to the *Met* V 8 passage. The expression ὁρίζοντά τε καὶ τόδε τι σημαίνοντα with reference to mathematical and geometrical entities is a hendiadys that Aristotle uses to express the idea that the limits circumscribe and at the same time determine that of which they are limits. The expression σημαίνειν τόδε τι is typically Aristotelian, and is found in numerous passages of Aristotle's works. However, its occurrence in *Met* V 8 is very peculiar, in the sense that, given the standard meaning of this expression for Aristotle, from his point of view it is not appropriate to characterise mathematical and geometrical entities. For limits, as well as numbers, are relational concepts; they do not by themselves express something determinate.

The majority of commentators, ancient and modern, try to find a meaning for the expression σημαίνειν τόδε τι which can fit the context of *Met* V 8 and at the same time be consistent with Aristotle's doctrine. Among the ancient commentators Alexander of Aphrodisias for instance suggests three different possible readings. On the first one, the limit of a body means something determinate because, by marking its boundaries, distinguishes in space a body from everything else that surrounds it. Hence the limit signifies something determinate in the sense that it signifies that what is delimited by it is something determinate.[23] On the second reading, signifying something determinate amounts to expressing the form in virtue of which something is what it is. Hence the limits are that in virtue of which the geometrical form of a body is determined and defined. But this second interpretation suggested by Alexander is inconsistent with what Aristotle says e.g. in *Cat* 8 where the external configuration of something is explicitly said to be that in virtue of which something is of a certain quality, and not that in virtue of which something is something determinate.[24] In order to avoid this possible objection, Alexander indeed adds that

---

[22] See also Annas (1976: 209). I will return to the analysis of the passage below p. 30.

[23] Alex *In Met* 373, 25-7: οὐσίας φησὶ λέγεσθαι καὶ ὅσα μόρια ἐνυπάρχοντά τισιν ὁρίζει τε αὐτὰ καὶ τόδε τι εἶναι αὐτὰ σημαίνει

[24] Alex *In Met* 374, 6-8: τόδε δέ τι σημαίνειν εἶπε τὰ πέρατα, ὅτι κατὰ ταῦτα αἱ μορφαὶ τῶν σωμάτων, ἀφ' ὧν τάδε τινὰ εἶναι λέγεται, οἷον κύβοι, σφαῖραι. ἢ κατὰ ταῦτα οὐ τάδε ἀλλὰ τοιάδε λέγεται. The second reading suggested by Alexander collapses together two accounts of limit that Aristotle gives in *Met* V 17, which are the following: 1) 'we call limit the form, whatever it may be, of a spatial magnitude or of a thing that has magnitude' (1022a5-6); 2) 'we call limit the substance

the bodies are said, in virtue of their limits, not τόδε but τοιόνδε. In this way, however, Alexander makes the suggested reading for σημαίνειν τόδε τι unclear. The impression is that Alexander is trying to fit within a single coherent framework, even at the cost of clarity, what is genuinely Aristotle's doctrine, namely that the formal configuration of something has to be understood as a quality of that thing, and what is not Aristotle's doctrine, namely the view that mathematical and geometrical entities are substances. Finally, on the third suggested reading, lines and surfaces mentioned in *Met* V 8 mean something determinate for they are themselves something determinate, since they have features on their own besides the fact that they are limits of bodies.[25] *Pace* Alexander, this is not however a position that Aristotle would endorse, for, for something to have features on its own does not amount *ipso facto* to being something determinate in the sense of being a τόδε τι.

The exegetical suggestions put forward by Alexander have been taken up and expanded by modern interpreters: e.g. Ross (1924: I, 310) follows the first reading by Alexander and understands that the limits are a sort of individuation principle, 'marking off individual from individual'. Kirwan (1971: 148) also adopts that reading and distinguishes two uses of ὁρίζειν, one to mean 'to bound' and the other to mean 'to provide a principle of individuation'. On the understanding that what Aristotle is saying is that surfaces, *qua* limits, act as boundaries to physical bodies, his point is that two physical bodies are τόδε τι in case their surfaces are discontinuous, and they are discontinuous in case no line is part of both. Kirwan's interpretation combines together Alexander's first and third interpretative suggestions.

Another very crucial piece of textual evidence in *Met* V 8 for addressing the question whether the account of substance given is to be taken as genuinely Aristotelian or not is to be found at 1017b18-9:

---

of each thing, and the essence of each; for this is the limit of knowledge; and if of knowledge, of the object also' (1022a8-9). Alexander's interpretation clashes with *Cat* 10a11-16: 'A fourth kind of quality is shape and the external form of each thing, and in addition straightness and curvedness and anything like these. For in virtue of each of these a thing is said to be qualified somehow; because it is a triangle or square it is said to be qualified somehow, and because it is straight or curved. And in virtue of its form each thing is said to be qualified somehow'.

[25] Alex *In Met* 374, 9-11: λέγει δὲ τόδε σημαίνειν τὴν ἐπιφάνειαν καὶ τὴν γραμμήν· πρὸς γὰρ τῷ πέρατα εἶναι καὶ φύσιν τινὰ οἰκείαν σημαίνειν δοκεῖ καὶ οὐσίαν.

[ὅσα μόρια] ὧν ἀναιρουμένων ἀναιρεῖται τὸ ὅλον, οἷον ἐπιπέδου σῶμα, ὡς φασί τινες, καὶ ἐπίπεδον γραμμῆς· καὶ ὅλως ὁ ἀριθμὸς δοκεῖ εἶναί τισι τοιοῦτος (ἀναιρουμένου τε γὰρ οὐδὲν εἶναι, καὶ ὁρίζειν πάντα)·

[Those parts] by whose destruction the whole is destroyed, as the body is by the destruction of the plane, as some say, and the plane by the destruction of the line [are substances]; and in general number is thought by some to be of this nature; for if it is destroyed, they say, nothing exists, and it limits all things.

Let us for the moment focus on the point that certain parts of the bodies, namely their limits, are such that eliminating them (by means of ἀφαίρεσις)[26] implies the elimination of the whole they are parts of. E.g. eliminating the surface of a solid implies eliminating the solid, and eliminating the line which is the limit of the surface implies eliminating the surface. This is a new principle for substancehood in *Met* V 8, which I call *Elimination Principle*, for it identifies as substance that the elimination of which implies the elimination of other things. Aristotle's account is very sketchy, and can be read as offering either of these two versions of the elimination principle:

- Strong *elimination principle*: substance is that the elimination of which implies the elimination of everything else, e.g. numbers are substances;
- Weak *elimination principle*: the substance of something is that the elimination of which implies the elimination of that thing, e.g. the geometrical entities are substances.

By means of the weak elimination criterion different degrees of substantiality can be distinguished and ordered according to different degrees of ontological dependence.

There are in Aristotle's works a few other passages in which the elimination criterion is mentioned as a way of identifying what substance is. For instance in the *Protrepticus* (Iamb *Protr* 6), where the conceptual framework is still quite Platonic, Aristotle introduces the following sequence of items ordered according to the elimination criterion: numbers, lengths, surfaces, solids. Here too, like in *Met* V 8, 1017b20-1, the first item in the sequence is numbers, presumably because *via*

[26] The only other occurrence of ἀναιρέω with the same meaning is in *Met* XII 6, 1071a34-5; see Bonitz *Index* 45b36-7. It is a very rare use in Aristotle.

geometrical dimensions they give determination to every sensible thing. The elimination of numbers would imply the elimination of everything. Besides the *Protrepticus*, we find the sequence: units, points, lines, surfaces, bodies, also in *Met* III 5 and VII 2.[27]

The elimination principle and the subjecthood principle appear to bear very different results in the investigation of what substance is. We need now to address the question of how the elimination principle relates to the subjecthood principle. Are both principles genuinely Aristotelian? Or is only one of them? Or is neither?

The subjecthood principle in its application in *Met* VII 3 leads in the first instance to a multiplicity of candidates to be substance (without however clarifying which of them is substance in the fullest degree): essence, universal, genus and substratum. When applied the first time around, the principle proves to be not fully adequate precisely because it does not select a single type of entity as substance, but rather entities metaphysically very different. For matter, form and the compound all satisfy the condition of being subject of all predications, without being in turn predicated of anything else. In its second application later on in the chapter, the subjecthood principle leads to matter as that which is substance in the fullest sense. For Aristotle, both these results are to be rejected.

Many contemporary commentators (e.g.; Schofield 1972: 97-101; Stahl 1981: 177-180; Scaltsas 1985: 215-40) have given a semantic interpretation of the application of the subjecthood criterion at 1029a20-6, but if this interpretation is correct the way substance is identified in *Met* VII 3 would be only a reformulation of

[27] *Met* II 5, 1001b26-1002a11: 'A question connected with these is whether numbers and bodies and planes and points are substances of a kind, or not. If they are not, it baffles us to say what being is and what the substances of things are. For modifications and movements and relations and dispositions and ratios do not seem to indicate the substance of anything; for all are predicated of a subject, and none is a 'this'. And as to the things which might seem most of all to indicate substance, water and earth and fire and air, of which composite bodies consist, heat and cold and the like are modifications of these, not substances, and the body which is thus modified alone persists as something real and as a substance. But, on the other hand, the body is surely less of a substance than the surface, and the surface than the line, and the line than the unit and the point. For the body is bounded by these; and they are thought to be capable of existing without body, but body incapable of existing without these. This is why, while most of the philosophers and the earlier among them thought that substance and being were identical with body, and that all other things were modifications of this, so that the first principles of the bodies were the first principles of being, the more recent and those who were held to be wiser thought numbers were the first principles. As we said, then, if these are not substance, there is no substance and no being at all; for the accidents of these it cannot be right to call beings'. *Met* VII 2, 1028b16-8: 'Some think [that substances are] the limits of body, i.e. surface, line, point, and unit, are substances, and more so than body or the solid.'

the very same criterion introduced by Aristotle in *Met* V 8, 1017b13-4. I disagree with this interpretation, because I see an important discrepancy between *Met* V 8 and VII 3. In *Met* VII 3 the investigation is on the ultimate subject, i.e. the subject of every possible predicate, that of which everything else is predicated. The very idea of a subject of which everything else is predicated appears puzzling, and indeed Aristotle himself believes that defining substance as ultimate subject is not adequate (1029a9: οὐ γὰρ ἱκανὸν), for it is not clear (1029a10: αὐτὸ γὰρ τοῦτο ἀδῆλον), and furthermore it leads to something profoundly different from the other proper subjects, namely it leads matter (1029a10: καὶ ἔτι ἡ ὕλη οὐσία γίγνεται). The ἀφαῖρεσις method is at work both in *Met* V 8 and VII 3, but the results are metaphysically very different: in the former the ultimate subject turns out to be matter, which is something maximally indeterminate, and in the latter numbers, which are something maximally determinate. It seems plausible to explain this discrepancy in the following way. Aristotle does not ever endorse the elimination criterion *propria persona*, but only in the *Protrepticus*, which is an early work of Platonic inspiration.[28] In *Met* V 8 Aristotle is reporting an account of substance he received from other thinkers, very probably from within Plato's Academy.

It is well attested that within Plato's Academy the 'progression' of dimensions (length, width and depth) and their various mutual dependencies, were after Plato one of the central topics of discussion, along with the discussion of the metaphysical role played by the One and the Diad.[29] Some passages of Aristotle's *Metaphysics* (e.g. VII 2, 1028b16-8; XIV 3, 1090b5-7) attest that the Platonists discuss what type of dependence is illustrated by the sequence: line, surface, solid. Solids are limited by surfaces, and surfaces by lines, therefore a surface can exist without a solid, but a solid cannot exist without a surface, and a line can exist without a surface but not a surface without a line. This asymmetry suggests, for the Academics, that a certain ontological complexity corresponds to a certain logical dependency. Metaphysically simple entities are metaphysically and logically prior to metaphysically complex ones. For Aristotle however this tenet, of Platonic inspiration, does not hold true. For him, the equivalence between ontological simplicity and existence *per se* is not

[28] Furthermore, we do not know enough about the *Protrepticus* because it has come down to us only in a fragmentary state.

[29] In the following Aristotelian reconstruction of the Platonic doctrines I am guided by Annas' suggestions (1976: 41-77).

compatible with the hylomorphic analysis of reality he holds (forms e.g. are simple but they do not exist if not instantiated). Furthermore, there is a more general difficulty with the Platonic view: numbers, which are mathematical entities, and magnitudes, which are geometrical entities, cannot be derived from the same principles, for the sequence of magnitudes should have as first item the point, and there appears to be no way to reach numbers by adopting the same procedure whereby the line follows the point, the surface follows the line, the solid follows the surface.[30] The difficulty just pointed out emerges if one reads together the following passages from the *Metaphysics* (all quoted above): II 5, 1001b26-1002a11; VII 2, 1028b16-8 (where Aristotle mentions the sequence: units, points, lines, surfaces, bodies); and the third section of V 8 (where each elements is said to be immanent part of the following one, see 1017b17: μόρια ἐνυπάρχοντά). The idea that the unit is the substance of the point as its immanent part seems patently incoherent. One cannot make sense of it even in the light of the doctrines which seem to be the most akin to it, namely the Pythagoreans' ones. For the Pythagoreans there is a sense in which numbers are immanent in the sensible substances, but this should not be taken to mean that the unit is metaphysically immanent in the point.[31] In order to make better sense of the position that Aristotle reports, one can take it to claim that the unit is prior to the point in the sense that the unit enters in the definition of the point. But this consideration only explains the step from the unit to the point, and it does not adequately account for the other steps in the sequence, for according to the elimination criterion each item is the substance of the one that follows in the sequence, and it is not only part of its definition.

Let us consider another passage in which Aristotle talks about the elimination criterion, in *Met* V 11, 1019a1-4. There Aristotle distinguishes two senses in which something is prior to something else. If $x$ is prior to $y$ ontologically, then (a) the elimination of $x$ implies the elimination of $y$, and (b) the elimination of $y$ does not imply the elimination of $x$. By distinguishing (a) from (b) Aristotle brings to light an asymmetry the elimination criterion relies on.[32] In the light of this distinction, from

[30] For this point, regarding Speusippus in particular, see Cherniss (1962: 131-3).
[31] I cannot enter the topic in this context, see e.g. Centrone (1999).
[32] See in *Cat* 5, 2b5-6 the principle that determines the distinction of primary substances from their accidents, on the basis of the fact that the elimination of substances implies elimination of accidents, but not *vice versa*.

Aristotle's point of view those who endorse the elimination principle (in its original formulation) run into the difficulty of how to derive the point from the unit, which should be the substance of the point, because they conflate and do not distinguish between logical priority and ontological priority. Aristotle himself in *Met* XIII 2, 1077a36-b11, mentions that geometrical entities may be ordered according to a different degrees of ontological priority, but he denies that these degrees correspond to different degrees of substantiality.

To recapitulate the results of the analysis given so far, the elimination criterion, briefly described in *Met* V 8, is a theoretical acquisition that Aristotle attributes to his predecessors, and that, from his own point of view, is inadequate as a principle of substancehood, because by this criterion numbers turn out to be substances. The analysis of the third section of *Met* V 8 provides evidence in support of the hypothesis that in this chapter Aristotle is reporting, but also to some degree modifying, an account of substance held by his predecessors who thought that mathematical and geometrical entities are substances, and numbers are what has the highest degree of substantiality. Aristotle does not agree with this account, even if apparently he has taken it into consideration with interest at least in an earlier stage before the central books of the *Metaphysics*. Evidence for this last point is to be found especially in the *Protrepticus*, but also in *Met* III 5, 1001b26-1002a14, where the claim that mathematical and geometrical entities are substances is the first branch of the *aporia* XIV.[33]

[33] *Met* III 5, 1001b26-1002a14: 'A question connected with these is whether numbers and bodies and planes and points are substances of a kind, or not. If they are not, it baffles us to say what being is and what the substances of things are...the body which is thus modified alone persists as something real and as a substance. But, on the other hand, the body is surely less of a substance than the surface, and the surface than the line, and the line than the unit and the point. For the body is bounded by these; and they are thought to be capable of existing without body, but body incapable of existing without these. This is why, while most of the philosophers and the earlier among them thought that substance and being were identical with body...the more recent and those who were held to be wiser thought numbers were the first principles'. I follow Ross' way of numbering the *aporia* (1924: 246-8).

### 1.4 Substance is essence

The fourth account of substance given in *Met* V 8 is to be found at 1017b21-22:

> ἔτι τὸ τί ἦν εἶναι, οὗ ὁ λόγος ὁρισμός, καὶ τοῦτο οὐσία λέγεται ἑκάστου.
>
> The essence, the formula of which is a definition, is also called the substance of each thing.

The terminology in this passage is typically Aristotelian.[34] The identification of the essence as the principle of substantiality is attested in many passages of Aristotle's works, and in particular in the logical works, especially in the *Topics* and in the *Posterior Analytics*, but also in the *Metaphysics*.[35] This may already be taken as an indication once again that *Met* V, 8 has a bridging role between different stages of Aristotle's investigation. (More arguments in support of this point will follow.)

Among the ancient commentators, Alexander (*In Met* 374,37-375,13) remarks that in this account everything that has a definition, hence an essence, would have substantiality, even non substances. But this is an unwelcome result for Aristotle. To avoid it, Alexander resorts to the distinction between what is substance in the primary sense (κυρίως) and what is substance only in a qualified sense (οὐκ ἁπλῶς). What is substance in the second account in *Met* V, 8, 1017b14-16, is substance in the primary sense; it is what makes each of the sensible substances what it is, and it is its form (φυσικὸν εἶδος). What is substance in the fourth account, at 1017b21-22, is

---

[34] Dubois (1998: 143-4) places much importance on Aristotle's use of the terms τὸ τί ἦν εἶναι and ὁρισμός in this sentence. He holds that the fourth section of *Met* V 8 is intended to be a recapitulation of the two accounts of substance he takes Aristotle to have given in the earlier part of the chapter. Hence, he takes τὸ τί ἦν εἶναι to express what he calls the 'existential' characterisation of substance, and ὁρισμός what he calls the 'essential' characterisatioon of it. This interpretation however has no ground in the text. For Dubois' interpretation see also above p. 11.

[35] In the *Topics* see e.g. I 4, 101b19-23; 5, 101b38; 8, 103b9-10. Note that in the passages just quoted we find the term ὅρος instead of ὁρισμός, but this does not make any significant difference to the point. See also Bonitz *Index* 524b45. In the *Posterior Analytics* see e.g. II 6, 92a6-10; 11, 94a34-5. In the *Metaphysics* see e.g. VII 4, 1030a6-7.

substance only in a qualified sense; it is what makes everything, even what is not a substance, to have an essence.

Modern interpreters too comment on the connection between the second and the fourth accounts of substance in the chapter, but on the basis of considerations different from Alexander's. Bonitz (*In Met* 243-4) and Ross (1924: I 310) for example note that what is substance in the fourth account satisfies also the previous two characterisations of substance in the chapter. In particular, the second and the fourth accounts are closely connected. E.g. the soul is mentioned in the second account in *Met* V 8 at 1017b16 as an example of substance *qua* the cause of being for living things. In *Met* VII 10, 1035b14-6, the soul is defined as substance as the form and essence of living beings.[36] Hence, the soul should count as substance also on the second and the fourth account of *Met* V 8. Furthermore, on the model of scientific explanation that Aristotle gives in the *Posterior Analytic* the essence of something, which is identified with the form, is said to be the cause of its being: the two accounts of substance distinguished in *Met* V 8 collapse into one in the *Analytics*.

[36] *Met* VII 10, 1035b14-6: ἐπεὶ δὲ ἡ τῶν ζῴων ψυχὴ (τοῦτο γὰρ οὐσία τοῦ ἐμψύχου) ἡ κατὰ τὸν λόγον οὐσία καὶ τὸ εἶδος καὶ τὸ τί ἦν εἶναι τῷ τοιῷδε σώματι.

## 2. Aristotle's own conception of substance: Its origins (*Categories*); Its development (*Metaphysics* V 8); Its refinement (*Metaphysics* VII 3)

The main difficulty in interpreting the final part of *Met* V 8, 1017b23-26, consists in determining whether this section is meant to be a recapitulation and generalisation of what Aristotle has said so far (as it seems indicated by the transition formula: συμβαίνει δή) or rather a further account of substance:

> συμβαίνει δὴ κατὰ δύο τρόπους τὴν οὐσίαν λέγεσθαι, τό θ' ὑποκείμενον ἔσχατον, ὃ μηκέτι κατ' ἄλλου λέγεται, καὶ ὃ ἂν τόδε τι ὂν καὶ χωριστὸν ᾖ· τοιοῦτον δὲ ἑκάστου ἡ μορφὴ καὶ τὸ εἶδος.
>
> It follows, then, that 'substance' has two senses, (A) ultimate substratum, which is no longer predicated of anything else, and (B) that which, being a 'this', is also separable and of this nature is the shape or form of each thing.

Interpreters disagree on this issue. Modern commentators divide into two groups. Some commentators, like Bonitz (*In Met* 244), Ross (1924: I 310), Cherniss (1962: 364) and more recently Dancy (1975: 96), Polanski (1983: 57-66) and Graham (1987: 216)[37] hold that the section currently under examination coherently concludes the whole chapter. The reason is that whatever satisfies the final characterisation of substance as ultimate subject and is also determinate and separate, satisfies also the characterisations of substance given in the previous four accounts. Other commentators, e.g. Kirwan (1971: 148-9) and Irwin (1988: 554-5), have difficulty in seeing a conceptual connection between the first four accounts of substance in the chapter and the final characterisation of substance.

I will first discuss the reasons why the first of the two interpretative approaches mentioned is unsatisfactory. I will concentrate on Polanski's interpretation, as the most significant representative of the first approach, according

[37] Graham (1987: 216) holds that Aristotle runs through the four accounts in the earlier part of the chapter as potential candidates to be substance, follwing the same method of invetstigation as in *Met* VII 3. Hence, there is a strong conceptual link between the earlier part and the final part of the chapter, which establishes what is for Aristotle substance. For Graham though Aristotle leaves un-stated some of the steps that lead him to the final conclusion, and this is why it is difficult for the interpreter to reconstruct Aristotle's reasoning.

to which the final section of *Met* V 8 is a recapitulation of the whole chapter. Polanski holds, as many other commentators do, that in the first part of the chapter, 1017b10-22 (which corresponds to the four sections I have distinguished so far), Aristotle presents accounts of substance given by other thinkers. The position that bodies are substances is generally shared in Aristotle's times, as it is also reported in several passages in the *Metaphysics* (e.g. VII 2, 1028b8-16; VIII 1, 1042a6-11; XII 1, 1069a25-30. Among these passages Polanski finds II 5, 1002a8-12 (quoted above, p. 32) the most relevant to V 8. There Aristotle mentions two accounts of substance. On the first one, bodies are substances, and everything that has a body is a substance. Polanski suggests supporters of this view are to be identified with the Ionian philosophers of nature (φυσιολόγοι). In the second account, numbers are the principle of substantiality for everything. Supporters of this view are to be identified with the so called dialecticians in Magna Graecia; these are the Eleatics, the Pythagoreans, and the Platonists. For Polanski the first account in *Met* II 5 corresponds to the first in V 8, and the second in II 5 to the third in V 8. Hence, from *Met* II 5 he claims we can infer whom the theories in V 8 are to be ascribed to. Furthermore, Polanski sees the second account in *Met* V 8 as the doctrine of substance held by those philosophers of nature who take the cause of being of each thing to be its nature (cf also *Met* V 4, 1014b35-7). Polanski suggests that this account is the meeting ground for both philosophers of nature and dialecticians. He finds evidence for this suggestion in *De An* I 2. There Aristotle reports that both the philosophers of nature and the dialecticians take the soul to be cause of movement and of knowledge, hence to be cause of being of living things. Polanski finds further support for this in the order of exposition in *Met* V 8, where the account of substance as cause of being appears in between the account of substance as body by the philosophers of nature, and the account of substance as geometric and mathematical entity by the Pythagoreans, who are among the dialecticians. However, not only do these textual observations by Polanski appear to prove very little with respect to the point he makes about the second account of substance in *Met* V 8, but Polanski also fails to show the relevance of his suggestion about the second account in relation to the reading of the chapter as a whole. Finally, the fourth account of substance in *Met* V 8 is, for Polanski, to be ascribed to the Platonists, as he finds confirmed by textual evidence mainly in *Met* I 7, 998a34-b6, in particular 988b4-5: ἀλλὰ τὸ τί ἦν εἶναι

ἑκάστῳ τῶν ἄλλων τὰ εἴδη παρέχονται. On the basis of the remarks mentioned so far, Polanski (1983: 60-1) proposes as a general interpretation of *Met* V 8 that Aristotle intends there to give a comprehensive, however sketchy, history of the metaphysics of substances. In Polanski's view, Aristotle highlights two main approaches to the problem of what substance is: the one is driven by the attempt to explain change and permanence (see the philosophers of nature), the other by the problem of individuation, in a broad sense (see the dialecticians). Within this interpretative framework, the final section of *Met* V 8 appears to be a coherent recapitulation of the contents of the whole chapter. In the final section the mention of substance as the ultimate substratum recalls the results of the investigations by the philosophers of nature (the substratum is what persists), while the mention of substance as something determinate and separate and hence maximally individuated, recalls the results of the investigations by the so called dialecticians. A careful textual analysis of *Met* V 8 however shows, as we have seen so far, that there is not enough support, *pace* Polanski, for the reading he suggests.

Is there any other argument beside Polanski's to be given in support of the first interpretative approach to the final section of *Met* V 8? In order to answer the question, we need first to clarify what the supporters of that approach intend by saying what they do. There are indeed two ways of understanding the claim that the final section of the chapter may be a recapitulation of what Aristotle has said before. On the one hand, the four accounts of substance in the chapter fall under the final description of what substance is in a distributive way, namely what substance is according to each of the four accounts falls either under the description of substance as ultimate subject or under the description of substance as something determinate and separate (but not under both).[38] Alternatively, what substance is according to each of the four accounts falls under both descriptions of substance given in the final section; hence substance is both the ultimate subject and something determinate and separate.

Let us examine whether it is sound to take Aristotle to be saying that of all things that are substances according to the four accounts in *Met* V 8, some are τὸ θ' ὑποκείμενον ἔσχατον but they are not τόδε τι and χωριστὸν, and others are τόδε

[38] See Cherniss (1962: 365): 'The two meanings of οὐσία as ὑποκείμενον and as τόδε τι and χωριστὸν are incompatible'.

τι and χωριστὸν but they are not τὸ θ' ὑποκείμενον ἔσχατον. This interpretation seems to be ruled out on the ground that nothing is mentioned in the chapter that is only ὑποκείμενον ἔσχατον but not also determinate and separate. Within Aristotle's metaphysics matter is what we expect to play the role of ultimate substratum, which is neither separate nor determinate, but matter as such is not mentioned in *Met* V 8. In response to this difficulty Bonitz (*In Met* 244) and Ross (1924: I 310), note that the expression τὸ θ' ὑποκείμενον ἔσχατον may refer both to individual substances and subjects of predication of accidents, and to matter which is subject of predication of forms.[39] If this is correct, then what is substance on the first account falls under the description of τὸ θ' ὑποκείμενον ἔσχατον with reference to being the subject of predication of accidents, while what is substance in the second, third and fourth account falls under the description of τόδε τι and χωριστὸν. Some support for Bonitz's and Ross' interpretation is to be found in *Met* V 6 (see also comments *ad locum* in chapter 2), where water, which is one of the four elements, hence is a substance on the first account in *Met* V 8, is said to be τὸ ἔσχατον ὑποκείμενον. But overall it is not clear at all that Aristotle meant to include (implicitly) in *Met* V 8 matter too.

On the other hand, is it sound to take Aristotle to be saying that what is substance in the four accounts in the chapter is both ὑποκείμενον ἔσχατον and separate and determinate? The difficulty that this reading faces is that not everything mentioned in the chapter as a substance is also τὸ θ' ὑποκείμενον ἔσχατον. Various scholars have offered interpretative solutions to this difficulty. For instance, among the ancient commentators Alexander of Aphrodisias (*In Met* 375, 19-24) addresses the question of how physical bodies, which are substance on the first account in *Met* V 8, can be ὑποκείμενον ἔσχατον. In order to solve the difficulty, he assumes that every substance is a ὑποκείμενον but introduces a criterion for distinguishing different degrees for being a ὑποκείμενον, presumably on the basis of the consideration that if there is an ultimate degree (ἔσχατον) there must also be

[39] The distinction between these two types of ultimate substratum is clearly expressed in *Met.* IX 7, 1049a27-b2, provided that one accepts, following Ross (*ad locum*) and Jaeger (*ad locum*), Apelt's conjecture at l. 1049a28 καθ' οὗ instead of καθολου which appears in the manuscripts and in Ps-Alex. (*In Met* 583, 26). Other commentators however, e.g. Gill (1989: 155-161) and Witt (1989: 166), do not accept Apelt's conjecture and claim, but without persuasive arguments, that in that context Aristotle is distinguishing the substratum from universal, rather than two types of substratum.

other degrees lower than it. In Alexander's view, this criterion allows physical bodies to be to some degree a ὑποκείμενον, but not an ultimate one.

Among modern interpreters, Georgiadis (1978: 89-91) tries to address the same difficulty as Alexander by putting forward a different reading of lines 1017b25-6. There we find a neuter demonstrative pronoun: τοιοῦτον. According to the most natural reading of the text this pronoun refers to substance *qua* something determinate and separate (1017b25: ὃ ἂν τόδε τι ὂν καὶ χωριστὸν ᾖ). On this reading, the expression τοιοῦτον δὲ ἑκάστου ἡ μορφὴ καὶ τὸ εἶδος is epexegetic of the formula immediately preceding ὃ ἂν τόδε τι ὂν καὶ χωριστὸν ᾖ. An alternative reading however is also possible, as Georgiadis argues. Georgiadis suggests the pronoun τοιοῦτον refers to the substance (1017b23: οὐσίαν), independently from any characterisation of it as both ultimate subject and something determinate and separate. Georgiadis offers the following translation of the text:

> It follows, then, that substance is said in two ways: 1) that which is both (a) the ultimate subject that is no longer predicated of anything else and (b) a this and a separable; substance is also 2) the shape of from of each thing.

In Georgiadis' view Aristotle is distinguishing a sense in which substance is what plays the role of ultimate subject and is also separate and determinate, and another sense in which substance is the form of each thing. This reading is a viable alternative, but not a preferable one in my view because it takes the pronoun τοιοῦτον as referring to something distant in the order of exposition and also requires one to give the particle δὲ a meaning that does not seem to fit the context. *Contra* Georgiadis, the particle δὲ is here to be understood as connective with the value of continuity.[40]

Let us now turn to the second interpretation of the last section of *Met* V 8, namely that this is a recapitulation of the whole chapter, hence whatever is substance in one of the previous four accounts is also τὸ θ' ὑποκείμενον ἔσχατον and τόδε τι and χωριστὸν. By this line of interpretation it is difficult to understand how the

[40] In support of my reading see Denniston (1996: 169): 'δὲ for γὰρ, οὖν (or δή), ἤ. δὲ is not infrequently used where the context admits, or even appears to demand, γὰρ (or occasionally οὖν or δή). In such cases the writer is content with merely adding one idea to the other, without stressing the logical connection between the two, which he leaves to be supplied'.

mathematical and geometrical entities and that which is the cause of being of each thing can be a ὑποκείμενον. Furthermore, this interpretation appears to presuppose what Aristotle achieves at a later stage of his investigation on substance. In *Met* VII 3 indeed it is clear that being an ultimate subject and being something determinate and separate are conditions that something has to jointly satisfy in order to count as substance; see e.g. 1029a27-30:

> καὶ γὰρ τὸ χωριστὸν καὶ τὸ τόδε τι ὑπάρχειν δοκεῖ μάλιστα τῇ οὐσίᾳ, διὸ τὸ εἶδος καὶ τὸ ἐξ ἀμφοῖν οὐσία δόξειεν ἂν εἶναι μᾶλλον τῆς ὕλης.
>
> Both separability and 'thisness' are thought to belong chiefly to substance. And so form and the compound of form and matter would be thought to be substance, rather than matter.

In *Met* VII 3 being determinate and separate are two criteria for substancehood which Aristotle adds to the subjecthood criterion, once the subjecthood criterion turns out to be by itself insufficient (see 1029a9). As it appears from 1029a27-8, substance, once correctly identified, is the subject of which everything is predicated, but is not itself predicated of anything else; and it is also something determinate and separate. But there is an apparent discrepancy between *Met* VII 3 and V 8. For, in the latter Aristotle seems to distinguish – as if they were independent from each other – the two main criteria for substantiality, being an ultimate subject and being determinate and separate. While in *Met* VII 3 he presents the very same two criteria as jointly necessary for individuating substance. The criterion of being the ultimate ὑποκείμενον if applied by itself picks out, as we see in *Met* VII 3, matter as matter-of-the-composites. The criterion of being τόδε τι and χωριστὸν by itself picks out the form, as we see in *Met* V 8, 1017b25-6. According to which of the two criteria are composites substances? Composites are substances in the first account in *Met* V 8; being composite of matter and form according to the final section of *Met* V 8 they should both count as ultimate subjects of predication and as something determinate and separate. The question to address now is this: assuming that being separate and determinate are features of the form (see *Met* V 8, 1017b25-6), and that the composites too are separate and determinate, either the composites are somehow to be identified with the forms, in the sense that forms are

particulars,[41] or alternatively the composites are something separate and determinate in a different sense from the one that applies to the forms. On this second hypothesis, the terms τόδε τι and χωριστὸν have two meanings that need to be distinguished, one adequate to characterise the composite and the other the form. Within Aristotle's metaphysics forms are conceptually separable (λόγῳ) from what they are forms of, while the composites are conceptually separable, but also separate in fact from other things; see e.g. *Met* VIII 1, 1042a26-31. Analogously forms are said to be τόδε τι meaning that they are what is maximally determinate, while τόδε τι used for the composites has rather a deictic value, and points at the individual.

In order to gain a better understanding of the last section of *Met* V 8 in relation to the previous part of the chapter, I turn now to the analysis of some other relevant passages in Aristotle's works in which we can discern the origin and development of the notion of being τόδε τι, pivotal in his account of substance. The interpretation I will argue for is that the notion of τόδε τι, literally 'this something', is of Platonic origins. In the earliest stage τόδε τι for Aristotle is something that can bear the predication of opposite qualities (see e.g. *Cat* 5, 4a10-36). I claim Aristotle learns from Plato that there needs to be something that plays that role: for Plato the role is played by the substratum-receptacle, for Aristotle by the τόδε τι. In my view there is continuity between Plato and Aristotle in understanding the need in ontology for something that can bear the predication of the contraries. But Aristotle also adds to the Platonic notion of substratum the distinction between what belongs to it accidentally and what belongs to it essentially. Aristotle refutes by *reductio ad absurdum* the Platonic conception of matter as something that is supposed to be on the one hand completely un-determinate, but on the other a substance with some determination ('something', τι).[42] Aristotle replaces Plato's conception of matter – which he finds absurd – with his own: matter is completely un-determinate but for this very reason cannot be a proper subject of predication.

Aristotle connects the notion of τόδε τι with that of indivisibility. Indivisibility is a central notion in Aristotle's characterisation of substances in the *Categories*. As we see in *Cat* 5, 3b10-18,[43] primary substances are by definition τόδε

[41] See Frede-Patzig (1988, 36ff.).

[42] Aristotle takes the Platonic substratum to have substantiality; see e.g. *Met* VII 16, 1031b15-8.

[43] *Cat* 5, 3b10-18: Πᾶσα δὲ οὐσία δοκεῖ τόδε τι σημαίνειν. ἐπὶ μὲν οὖν τῶν πρώτων οὐσιῶν ἀναμφισβήτητον καὶ ἀληθές ἐστιν ὅτι τόδε τι σημαίνει· ἄτομον γὰρ καὶ ἓν ἀριθμῷ τὸ

τι: they are something indivisible and one, by contrast with the secondary substances, which are divisible in the sense of being predicable of a multiplicity of subjects, each of which bears the name of the secondary substance that is predicated of it. Aristotle at no point in his metaphysical investigation severs the conceptual connection between being τόδε τι and being indivisible. But he does hold, at different times, different views regarding the indivisibility of substances. I will attempt to account for Aristotle's views by deriving them from the different criteria for divisibility he offers in different parts of his works.

From the analysis of all relevant passages, it appears that Aristotle admits at least two criteria of divisibility, the one irreducible to the other, which determine two different ways in which something can be indivisible, and therefore τόδε τι. The first criterion for indivisibility, to be found in *Cat* 5, characterises secondary substances:

**(D.1)** Y is divisible iff there is some X such that Y is predicated of X and X receives the name 'Y'.

Using this criterion, secondary substances are divisible, but primary substances are not. What is indivisible according to criterion **(D.1)** cannot however be taken *ipso facto* as τόδε τι. In particular from *Cat* 2, 1b 6-9, we learn that there are non-substantial entities that are indivisible and one in number, and not predicated of anything else, and yet they can be in more than one subject:

> ἁπλῶς δὲ τὰ ἄτομα καὶ ἓν ἀριθμῷ κατ' οὐδενὸς ὑποκειμένου λέγεται, ἐν ὑποκειμένῳ δὲ ἔνια οὐδὲν κωλύει εἶναι· ἡ γὰρ τὶς γραμματικὴ τῶν ἐν ὑποκειμένῳ ἐστίν.
>
> Things that are individual and numerically one are, without exception, not said of any subject, but there is nothing to prevent some of them from being in

---

δηλούμενόν ἐστιν. ἐπὶ δὲ τῶν δευτέρων οὐσιῶν φαίνεται μὲν ὁμοίως τῷ σχήματι τῆς προσηγορίας τόδε τι σημαίνειν, ὅταν εἴπῃ ἄνθρωπον ἢ ζῷον· οὐ μὴν ἀληθές γε, ἀλλὰ μᾶλλον ποιόν τι σημαίνει, —οὐ γὰρ ἔν ἐστι τὸ ὑποκείμενον ὥσπερ ἡ πρώτη οὐσία, ἀλλὰ κατὰ πολλῶν ὁ ἄνθρωπος λέγεται καὶ τὸ ζῷον· 'Every subsatcne seems to signify a certain 'this'. As regards the primary substances, it is indisputably true that each of them signifies a certain 'this'; for the thing revealed is individual and numerically one. But as regards the secondary substances, though it appears from the form of the name – when one speaks of man or animal – that a secondary substance likewise signifies a certain 'this', this is not really true; rather, it signifies a certain qualification, for the subject is not, as the primary substance is, one, but man and animal are said of many things'.

a subject – the individual knowledge-of-grammar is one of the things in a subject.[44]

In order to accommodate this point and to restrict indivisibility to substances only, the previous divisibility criterion needs refinement, as follows:

**(D.1.1)** Y is divisible iff either there is some item X such that Y is said of X and X receives the name 'Y', or alternatively Y is in X and X receives a name derived from Y.

In other contexts Aristotle offers also a different way of expressing the very same conception of divisibility, with no reference to the *Categories* distinction between 'being said of' and 'being in'. In his later works the distinction between these predicative relations is much less prominent; everything that can be predicated of something else is regarded as divisible; indivisibility is what distinguishes the universals from their proper subjects, i.e. the particular substances (see e.g. *Post Anal* I 22). **(D.1.1)** may then be reformulated thus to reflect Aristotle's use of a different terminology:

**(D.1.2)** Y is divisible if there exists some X such that Y belongs (ὑπάρχει) to X and X bears Y's name.

By contrast, in the central books of the *Metaphysics* the hylomorphic analysis of substance and in particular the investigation of the ontological status of the forms brings about a radical change in the way Aristotle conceives indivisibility. The forms now are what is called indivisible and one.[45] The new criterion can be formulated thus:

---

[44] I will not discuss here in detail the interpretative issues that concern the passage in *Cat* 2 on which I base my formulation of **(D.1.1)**. I read the passage following Owen (1965: 96-105). I assume that indivisible is what cannot be further divided in species, and nevertheless may be in many things. My argument holds even if one takes the alternative interpretation of the passage suggested for instance by Ackrill (1963: 74-6). If one follows Ackrill's interpretation, indivisible is what 'is in' a single subject, as an universal which is instantiated in a unique individual. On Ackrill's reading of the passage, my claim may be reformulated thus: a secondary substance divisible according to **(D.1)** does not cease to be divisible even if there is only a single thing that falls under it, and a non-substantial entity divisible according to **(D.1.1)** does not cease to be divisible even if there is only one single thing it is in.

[45] See e.g. *Met* VII 8, 1034a5-8; 10, 1035a30-1, but also 10-12 *passim*.

**(IND.2)** A substantial form X is indivisible if there is no principle of division intrinsic to X such as to allow X to have subordinate forms which are still called 'X'.

The notion of indivisibility expressed by the criterion **(IND.2)** derives from the procedure of diairetic definitions. According to this procedure the higher *genera* are divided in lower, or subordinate, *genera* on the basis of intrinsic principles of division until the indivisible species are reached.[46] In the context of the *Analytics* and of other logical works, the criterion **(IND.2)** is employed to identify the ultimate species, while in the *Metaphysics* to identify the substantial forms, as we see for instance in *Met* VII 8, 1034a5-8 and X 9, 1058b8-10.

To recapitulate, there appear to be two main conceptions of divisibility/indivisibility at work in Aristotle's works: **(D.1.1)** and **(D.1.2)**, which I take as a single criterion formulated in two different ways, and **(D.2)**. These criteria express respectively Aristotle's views at different stages of his investigation, in an early stage before the central books of the *Metaphysics* were written, and in the stage corresponding to the central books of the *Metaphysics*. The two criteria are not reducible one to the other; but do they contradict one another? *Prima facie* it seems so. For, on the basis of the first one, formulated as **(D.1.2)**, every form is divisible, for it is predicated of other entities, whether substantial entities or not, which retain the name of that form. By contrast, on the basis of the second criterion **(IND.2)**, every form is indivisible, because it does not admit subordinate forms which have the same name as the higher form. For Aristotle though the case of forms generates no contradiction between the two criteria. For, for him forms are not predicated of anything. The relation of predication (belonging) between the form and the matter of the composite is *sui generis*. For, the form, when predicated of the matter, modifies ontologically the subject of which it is predicated. It modifies it by re-identifying it, by changing the matter it is predicated of into matter-of-something.[47]

It is clear from the previous analysis that different accounts of indivisibility are to be found in Aristotle's metaphysics; hence it is reasonable to expect that there are also different accounts of what it is to be τόδε τι, given the intimate connection between these two concepts. On one account the ὑποκείμενον is τόδε τι, but not

[46] Because of space limits, I cannot expand on this topic here. I mention only the relevant texts in which Aristotle describes the procedure: *Post Anal* II, in particular chapter 13, and also *Met* VII 13.

[47] Within the limits of the present work, I can only mention this point without being able to expand on it.

everything that is a τόδε τι is *ipso facto* a ὑποκείμενον. Being a ὑποκείμενον and being τόδε τι are co-extensive only when the ὑποκείμενον is a subject of predication such that it receives the predication of the form (with the qualification given above) and it takes its name from the predicated form, and nothing else receives that predication and takes its name from it. The primary substances of the *Categories* for instance fall under this description. So, on this account, the ὑποκείμενον is something determinate (a subject) and hence a τόδε τι (see e.g. *GC* I 3, 318b14-18; *Met* VII 8, 1033b21-4). But on another account the ὑποκείμενον is a substratum, hence un-determinate and not a τόδε τι (see e.g. *Phys* I 7, 191a8-14, *De Caelo* III 8, 306b16-20).

The coexistence, within Aristotle's metaphysics, of these two ways of conceiving the ὑποκείμενον, as something un-determinate or determinate, provides some evidence in support of the hypothesis of the continuity between Aristotle's and Plato's thought on this issue. In the *Timaeus*, in the very well-known passage in which he introduces the receptacle, 49D-51B, Plato makes some conceptual distinctions that acquire particular importance from Aristotle's point of view. I cannot examine here the specific interpretative issues concerning that passage, nor the question of the receptacle. What is relevant to the Aristotelian questions at issue here is Plato's position concerning the use of expressions τοῦτο and τόδε on the one hand, and τοιοῦτον on the other. For Plato, the individual sensible realities, which are subject to constant becoming, are to be called 'of a certain quality' (τοιοῦτον) provided that they keep constant at least certain features in their becoming, but not 'this' (τοῦτο and τόδε), because they are now one thing and then another (now τοῦτο then ἄλλο). Only the ὑποκείμενον of these individual realities can be properly said 'this' (τοῦτο and τόδε), because it always remains what it is. The example Plato offers to illustrate his conception of ὑποκείμενον shows us that it does have a determinate nature:

> Now imagine that a man were to model all possible figures out of gold, and were then to proceed without cessation to remodel each of these into every other, then, if someone were to point to one of the figures and ask what it is, by far the safest reply, in point of truth, would be that it is gold; but as for the triangle and all the other figures which were formed in it, one should never describe them as "being" seeing that they change even while one is

mentioning them; rather one should be content if the figure admits of even the title "suchlike" (τοιοῦτον) being applied to it with any safety.

The contraposition between 'being something' and 'being a qualitative determination' that Plato highlights in the passage above subsequently becomes an acquisition of Aristotle's metaphysics too. From Aristotle's point of view it is problematic to explain how the substratum can be something determinate (with its own characteristics that make it into a τόδε τι) and at the same time be what it is in virtue of something that is purely qualitative, namely the form (which, being purely qualitative, seems not to contribute to the ontological status of the substratum). In the *Categories* Aristotle solves this difficulty be saying that the primary substances are what they are, namely τόδε τι, in virtue of the secondary substances. And secondary substances are not strictly speaking mere qualities. When a secondary substance is predicated of a primary one, this means that the primary substance not only possesses a certain quality, but is also of a certain type, and the type is determined by the universal which is predicated directly of the individual.[48] Hence, already in the *Categories* Aristotle has available the conceptual tools that allow him to make use in his own theory of distinctions of Platonic origin, but without the inconsistencies that he finds in Plato. The interpretation I am suggesting may seem *prima facie* difficult to square with *Met* VII 8, 1033b19-26, where Aristotle claims that the forms 'sphere' and 'house' are not 'something determinate' (1033b22: τόδε δὲ καὶ ὡρισμένον οὐκ ἔστιν) but rather express only a qualitative determination (1033b21-22: τὸ τοιόνδε σημαίνει).[49] Hence the difficulty Aristotle finds with Plato's theory seems to affect his own too: some things have the ontological status of being τόδε τι in virtue of a purely qualitative characterisation. But a close examination of the passage in *Met* VII

[48] Secondary substances are predicated directly of the primary substances without the mediation of any other determination, but only, at most, of some aspect of the primary substance that takes the role of being the subject of predication. For example, the universal 'white' is predicated of the individual body by being predicated of its surface, which is part of the body itself. See *Cat* 5, 3b13-21.

[49] See *Met* VII 8, 1033b19-26: πότερον οὖν ἔστι τις σφαῖρα παρὰ τάσδε ἢ οἰκία παρὰ τὰς πλίνθους; ἢ οὐδ' ἄν ποτε ἐγίγνετο, εἰ οὕτως ἦν, τόδε τι, ἀλλὰ τὸ τοιόνδε σημαίνει, τόδε δὲ καὶ ὡρισμένον οὐκ ἔστιν, ἀλλὰ ποιεῖ καὶ γεννᾷ ἐκ τοῦδε τοιόνδε, καὶ ὅταν γεννηθῇ, ἔστι τόδε τοιόνδε; τὸ δὲ ἅπαν τόδε, Καλλίας ἢ Σωκράτης, ἐστὶν ὥσπερ ἡ σφαῖρα ἡ χαλκῆ ἠδί, ὁ δ' ἄνθρωπος καὶ τὸ ζῷον ὥσπερ σφαῖρα χαλκῆ ὅλως.

'Is there, then, a sphere apart from the individual spheres or a house apart from the bricks? Rather we may say that no 'this' would ever have been coming to be, if this had been so, but that the 'form' means the 'such', and is not a 'this'-a definite thing; but the artist makes, or the father begets, a 'such' out of a 'this'; and when it has been begotten, it is a 'this such'. And the whole 'this', Callias or Socrates, is analogous to 'this brazen sphere', but man and animal to 'brazen sphere' in general'.

8 shows that the forms mentioned there are Platonic Ideas, not Aristotelian substantial forms. Aristotle's argument in that context aims to show that the Forms are not individual things, contrary to what Plato holds, but universals. Forms *qua* universals have a classificatory function to perform, in so far as they express the belonging of what is generated to the very same species of the generatos (1033b22-3: ποιεῖ καὶ γεννᾷ ἐκ τοῦδε τοιόνδε); what is generated is an individual of a certain type (1033b23-4: ὅταν γεννηθῇ, ἔστι τόδε τοιόνδε).[50] In this respect there is full convergence between what Aristotle says in *Met* VII 8 and in the *Categories*, for universals are predicated directly of the individual subjects and the predication expresses the fact that those individuals are of a certain kind; universals in *Met* VII 8 are assigned a function analogous to the one of the secondary substances in the *Categories*.

In conclusion, the expression τόδε τι appears to be used by Aristotle at least in two different ways: on the one hand it refers to what is maximally determinate because it cannot be further divided, and on the other to what plays the role of ultimate subject of predication. In the stage of Aristotle's investigation that corresponds to the *Categories* the two meanings of the expression τόδε τι are not yet distinguished, for the primary substances are both the ultimate subjects of predication, and indivisible, hence maximally determinate. In a later stage, once Aristotle comes to recognise the fundamental metaphsyical role of matter and analyses substances in hylomorphic terms, the two meanings of the expression τόδε τι come apart. The prevailing meaning in the later stage of Aristotle's metaphysical investigation is the meaning according to which τόδε τι is what is maximally determinate. In this later stage also, as we have seen, the indivisibility criterion **(D.1.1)** which focuses on the relation of predication and belonging between the substance and everything else, is substituted by **(IND.2)** which focuses on the ontological status of forms. The conceptual enrichment of what it means to be a τόδε τι is parallel to the development of Aristotle's investigation on substance. In this respect, the very last section in *Met* V 8 belongs to a very Aristotelian context of investigation, and is to be located, conceptually, after the *Categories*. For, Aristotle in *Met* V 8 has already drawn the distinction between being an ultimate subject and being something separate and

[50] On this interpretation, the pronoun τόδε refers in one case to the material substratum from which something is generated (ἐκ τοῦδε) and in the other to the generated individual (τόδε τοιόνδε).

determinate. With regard to the four accounts of substance introduced in the first part of *Met* V 8, the last part of the chapter is not in my view a recapitulation of what Aristotle had said before, but rather a further development, a fifth account of substance: the genuinely Aristotelian account, which comes last in the order of exposition (and also in a possible reconstruction of a history of ideas, cf. 1017b23: συμβαίνει δὴ) after the exposition of the received opinions that Aristotle inherits from his predecessors. The final section of *Met* V 8 points to, but does not offer yet, the metaphysical solutions of the central books of the *Metaphysics*. The interpretative difficulties it presents depend on its being at the same time the conclusion of the *status questionis* on results already achieved by Aristotle's predecessors, and the proposal of new theoretical achievements by Aristotle himself still to be fully developed.

## Chapter 2: The Analysis of the Puzzle (I): The Number of an Entity

**Introduction**

*Met* V 6 is traditionally regarded as having four parts, of unequal length, which begin respectively at 1015b16; 1016b6; 1016b17; 1017a3.

The first part (1015b16-1016b6) has two sections, the first devoted to 'being one *per accidens*' (1015b16-36), and the second to 'being one *per se*' (1015b36-1016b6). What it means to be 'one *per accidens*' is investigated in relation to particulars (1015b16-27), and in relation to universals (1015b27-36). On the other hand, what it means to be 'one *per se*' is investigated in relation to what makes two (or more) things into one: i) physical continuity, whether natural or man-made (1015b34-1016a17); ii) oneness in substratum, which Aristotle describes in terms of either identity of the material substratum (101617-25) or identity of the genus (1016a25-32); iii) indivisibility in notion (1016a32-b23).

The second part of the chapter (1016b6-17) is rather brief, and is in fact merely a recapitulation of some of points Aristotle has made in the first part.

The third part (1016b17-1017a3) introduces the notion of 'one' as numerical unit. This part has two sections: the first one (1016b17-31) accounts for 'being one' as being a unit for measurement and hence as being a principle for counting and ultimately for knowing; the second section (1016b31-1017a3) mentions four different types of unity: i) oneness in number, ii) oneness in species, iii) oneness in genus, iv) oneness by analogy.

The fourth part (1017a3-6) is very brief and just lists three meanings for the term 'many', defined by contrast with the three of the meanings given above for 'being one *per se*'.

What neatly divides the chapter into two main parts is the approach Aristotle uses in each of them for his investigation: in the first part he is concerned with things that are in various ways one, while in the second he seeks a definition of what it is to be one. This interpretative suggestion finds support in *Met* X 1 (a text with apparent parallelisms with V 6), where Aristotle himself makes the following methodological remark at 1052b1-9:

δεῖ δὲ κατανοεῖν ὅτι οὐχ ὡσαύτως ληπτέον λέγεσθαι ποῖά τε ἓν λέγεται, καὶ τί ἐστι τὸ ἑνὶ εἶναι καὶ τίς αὐτοῦ λόγος. Λέγεται μὲν γὰρ τὸ ἓν τοσαυταχῶς, καὶ ἕκαστον ἔσται ἓν τούτων, ᾧ ἂν ὑπάρχῃ τις τούτων τῶν τρόπων· τὸ δὲ ἑνὶ εἶναι ὁτὲ μὲν τούτων τινὶ ἔσται, ὁτὲ δὲ ἄλλῳ ὃ καὶ μᾶλλον ἐγγὺς τῷ ὀνόματί ἐστι, τῇ δυνάμει δ' ἐκεῖνα, ὥσπερ καὶ περὶ στοιχείου καὶ αἰτίου εἰ δέοι λέγειν ἐπί τε τοῖς πράγμασι διορίζοντα καὶ τοῦ ὀνόματος ὅρον ἀποδιδόντα.

But it must be observed that the questions, what sort of things are said to be one, and what it is to be one and what is the definition of it, should not be assumed to be the same. 'One' has all these meanings, and each of the things to which one of these kinds of unity belongs will be one; but 'to be one' will sometimes mean being one of these things, and sometimes being something else which is even nearer to the meaning of the word 'one' while these other things approximate to its application. This is also true of 'element' or 'cause', if one had both to specify the things of which it is predicable and to render the definition of the word.

In the passage just quoted Aristotle explicitly distinguishes two methods of enquiry: the one consists in identifying those things in the world that fall under a certain concept, the other in giving a definition of the concept under investigation. The examples of concepts to which these two methods can be applied are: 'one', 'element', 'cause'. Hence, it is sound to hold that in *Met* V 6 Aristotle is precisely following the course of enquiry described in X 1, and that different methods of investigation characterise the two parts of V 6, 1015b16-1016b17 and 1016b17-1017a6 respectively.

Modern commentators, e.g. Bonitz (*In Met* 233-9), Ross (1924: I 300-5), Kirwan (1971: 133-40), and Dubois (1998: 57-63) agree on the difference just mentioned between the first and the second part of *Met* V 6. By contrast, those who want to defend the internal cohesion of the chapter as a whole, e.g. in the middle Ages Aquinas, do not acknowledge this methodological difference and see the *trait d'union* in the conceptual distinction between 'being one *per se*' and 'being one *per accidens*'. So much so that for instance Aquinas in his commentary explains all the various meanings offered in the chapter for the terms 'one' and 'many' by reference to 'being one *per se*'. Furthermore, Aquinas, in whose reading Aristotle gives in the

chapter two different series of meanings for 'being one *per se*', suggests a philosophical justification for that, always in an attempt to give the most unifying reading of the text.[51] Aquinas' reasoning goes as follows: Aristotle has to consider first what we could call the factual conditions for something to be 'one *per se*' (where by factual conditions I mean the concrete situations in which things appear in fact to be in their own right one) and then what we could call the logical conditions for something to be 'one *per se*' (which follow from the definition of 'one' as principle for counting, at 1016b18ff).[52]

Such an interpretative approach, which aims to highlight the coherence and the argumentative links between different passages of the Aristotelian text, is characteristic of scholars in the middle Ages and well exemplified by Aquinas, and in a later stage of the history of the exegetical tradition becomes the established method of exegesis. For example Paul of Venice in the early XV$^{th}$ century in his commentary reconstructs Aristotle's chapter in the most systematic way. Already from the *divisio textus* we see that Paul of Venice is less committed than Aquinas to respecting the original structure of the text, and presents it as a series of philosophical points that are meant to exhaustively account for the notion of oneness: i) the distinction between 'being one *per accidens*' and 'being one *per se*' (see 1015b16ff.); ii) five meanings of 'being one *per se*' (see 1015b36ff.); iii) the distinction between an improper and a proper sense of 'being one' (1016b9ff); iv) unity by continuity or by achievement of perfect realisation (see 1016b11ff.); v) the distinction between an absolute and a relative sense of 'being one' (see 1016b17ff.); vi) other four meanings of 'being one *per se*' (1016b31ff.).[53]

---

[51] Aquinas' reading however goes against the natural way of taking the text at 1016b31-1017b3, according to which Aristotle does not introduce a second list of meaning of 'being one *per se*', but rather different ways of counting.

[52] For Aquinas there are two moments to be distinguished in the investigation of the factual conditions: an analytic and a synthetic one, whereby first Aristotle distinguishes five meanings of 'being one *per se*' (see 1015b36ff.), and then reduces them to a single notion, namely indivisibility (see 1016b3ff.). Aquinas finds in Aristotle's text the following five criteria for something to be one *per se*: i) *natura continua*, ii) *subiectum totum indifferens forma secundum specie*, iii) *unume genus, divisum in opposites differentiis*, iv) *definition unius indivisa a definitione alterius*, v) *intellectus intelligens quidditatem omnino indivisibilis*. See *In Met* V, 1.7 [848] p. 230, and l. 8 [866] pp. 234-5. It is interesting to note that Aquinas, and Paul of Venice after him, considers uniqueness of material substratum and uniqueness of genus on the one hand, and uniqueness in definition and in intellection on the other hand as different principles that explain how different things are made into one. The same distinction is made also by Alexander of Aphrodisias in his commentary (*In Met* 366, 25ff).

[53] Respectively: *In Met* f. 60rb **M**, 172va **Pv**; f. 64ra **M**, 176ra **Pv**, f. 64va **M**, 176vb **Pv**, f. 64vb **M**, 177ra **Pv**, ff. 60rb-67va **M**, 172va-179rb **Pv**.

## 1. Accidental Oneness

In the first section of *Met* V 6 (1015b16-1016b6) Aristotle distinguishes items that are one *per accidens* from items that are one *per se*. I will first offer an account of the former ones, namely the accidental composites, and attempt to give an the explanation of what it means for these beings to be one.

The section 1015b17-36 contains two sub-sections. This is confirmed, at the linguistic level, also by the presence of a weakly adversative formula for the transition from one sub-section to the other (1015b23-4: ὁμοίως δὲ τρόπον τινὰ), noted already by the ancient commentators Alexander of Aphrodisias (*In Met* 362, 31-3) and Asclepius (*In Met* 313, 35-6). Aristotle first discusses what sense of being 'one *per accidens*' applies to accidental composites such as 'artistic Coriscus' (which is a composite of a substance and an attribute), and 'artistic and just Coriscus' (which is a composite of one substance and two attributes). Then, he focuses on what sense of being 'one *per accidens*' applies to two or more distinct items which make up a single composite, such as 'artistic Coriscus' and 'Coriscus' (where one items is contained within the other), and 'artistic Coriscus' and 'just Coriscus' (where one item largely overlap with the other).

At 1015b20 there is a divergence between the text edited by Ross and the one edited by Jaeger. Ross, following Alexander's commentary (*In Met* 362, 18) and in view of 1015b26, but without support from the manuscripts' tradition, adds <Κορίσκος> after μουσικὸς, so that the second example offered by Aristotle is: the artistic and the just are 'one *per accidens*' respectively with artistic Coriscus and just Coriscus.[54] By contrast, Jaeger does not print <Κορίσκος> after μουσικὸς, hence the second example given by Aristotle reads: the artistic and the just are 'one *per accidens*' with artistic and just Coriscus.[55] This textual point is relevant for the interpretation one gives to the whole section of *Met* V 6 we are considering. For, if one accepts Ross' reading, one can still hold that Aristotle is exploring in two ways the notion of accidental unity, but the two ways are not kept distinct in the examples

[54] Reale (1997: 205) translates the text adopting this reading, and so have recently done two French commentators: Duminil-Jaulin (1991: 40-1) and Dubois (1998: 53).
[55] Kirwan translates the text without Ross' addition (1971: 35).

that Aristotle gives. In fact on this reading Aristotle (oddly) alternates examples of monadic unity with examples of dyadic unity. This observation has been made also by Kirwan (1971: 134) and White (1971: 177-97 and 1986: 475-94), who complain that Aristotle does not actually group in a clear way his examples here.[56]

To clarify the terms of the discussion, and shed light on the exegetical problems we are addressing, let us turn to the origin (at least in terms of a conventional point of reference) of the distinction between the oneness that characterises a single entity with an intrinsic complex structure (monadic unity) and the oneness that applies to two or more distinct entities related in some way to each other (dyadic unity). These distinctions were first introduced in the course of the debate on the principle of individuation that took place in the first half of 1950's between Lukasiewicz, Anscombe and Popper (1953: 69-120). The debate is devoted to general philosophical questions, and only Lukasiewicz and Anscombe can be taken as directly contributing to Aristotelian scholarship; however various philosophical insights put forward in that debate have been employed by Aristotelian scholars for achieving a philosophically deeper understanding of Aristotle's texts.

The expression 'principle of individuation', that as Popper notes has no equivalent in Aristotle's philosophical jargon but rather comes from the medieval interpreters of Aristotle,[57] refers to that in virtue of which a certain thing is what it is by being one and identical to itself and at the same time different from everything else apart from itself. Lukasiewicz argues the principle of individuation is the form, and cannot be matter. Matter is totally un-determinate (according to the well known and much debated definition by Aristotle in *Met* VII 3, 1019a20-6).[58] Hence, matter cannot be what distinguishes one individual thing from another by making it identical to itself and different from any other thing. Furthermore, even if one grants that matter can explain the identity in time of an individual thing, this cannot be true over

[56] White argues that Aristotle is not able to keep conceptually distinct the different senses of the expression 'X and Y are one', and also merges together the notions of unity and identity in time. For a discussion of White's criticism of Aristotle, see Miller (1973: 483-90) and Matthews (1982: 231).

[57] E.g. Aquinas *Summa Contra Gentiles* lib. II c. XLIX.

[58] *Met* VII 3, 1019a20-26: 'By matter I mean that which in itself is neither a particular thing nor of a certain quantity nor assigned to any other of the categories by which being is determined. For there is something of which each of these is predicated, whose being is different from that of each of the predicates (for the predicates other than substance are predicated of substance, while substance is predicated of matter). Therefore the ultimate substratum is of itself neither a particular thing nor of a particular quantity nor otherwise positively characterized; nor yet is it the negations of these, for negations also will belong to it only by accident'.

time, for the matter that constitutes a concrete individual is subject to change over time.[59] *Contra* Lukasiewicz, for Anscombe it is the matter, and not the form, that is for Aristotle the principle of individuation, for matter distinguishes the individuals belonging to the same species, as we learn from many passages, e.g. *Met* VII 8.[60] Anscombe expresses the majority view among the commentators.[61] Popper on his part sees in Lukasiewicz and Anscombe two different and complementary approaches to the investigation of what is the principle of individuation. For Lukasiewicz the principle of individuation is the principle in virtue of which any given individual is something which is one (although it may be a complex intrinsic structure, and be composed of different parts). For Anscombe on the other hand the principle of individuation is the principle in virtue of which two or more individuals - each of which is one and identical to itself - are distinct from each other.[62] In the first case the emphasis is on the structure of the single individual, and on the unity of the multiplicity of parts which constitute the individual. In the second case, the emphasis is on the mutual relations (identity and difference) between a multiplicity of individuals which share the same form. For Popper both matter and form play the

---

[59] Lukasiewicz's position has been recently discussed by Charlton (1994: 50). See also note 61.

[60] *Met* VII 8, 1034a5-8: 'And when we have the whole, such and such a form in this flesh and in these bones, this is Callias or Socrates; and they are different in virtue of their matter (for that is different), but the same in form; for their form is indivisible'.

[61] Anscombe's position has been recently supported with new arguments by Gill (1994: 55-71). Gill reckons the difficulties that every attempt of identifying the principle of individuation either with form or with matter leaves unresolved. 'So the dilemma is this: either the account of particularity is explanatory but applies to all particulars indifferently without illuminating their difference, or the account differentiates the particulars but is not explanatory, because it presupposes the very thing that it meant to explain' (59). Gill herself holds what she calls a *weak individuation thesis*, which corresponds to the second horn of the dilemma she outlines. Namely, she takes Aristotle to have chosen, somehow arbitrarily, matter as principle of individuation of everything else, along the lines of what he says in *Met* VII 8, 1034a5-8 and V 6, 1016b31-5. But she also takes Aristotle to be aware of the partial inadequacy of this choice, as he indicates for instance in *Phys* V 4. In fact, for Gill Aristotle tends to use different principles of individuation according to the context of investigation: at times discontinuity of matter, at times the form, at times spatio-temporal location etc. This is what explains the seeming inconsistency of the textual evidence. Against this interpretation, and in support of the thesis that form is the principle of individuation of substance, is Charlton (1994: 45-50), who writes: 'Those who think we derive our identity from our matter mostly think this is Aristotelian doctrine. I have argued that this is not stated in the passages usually invocated, such as 1016b31-33 and 1034a5-8...Matter is not τόδε τι, not 'this something' (implied at *Met* VII, 1029a27-30), or at least not in itself (*De An* II, 412a7) or in actuality (*Met* VIII, 1042a27-8)...A mere quantity of matter, whether ordinary or prime, has not enough unity to play the role of that form from which a substance derives its identity'.

[62] Here is how Popper (1953: 100-1) formulates the two questions that the principle of individuation is supposed to answer, for Lukasiewicz and Anscombe respectively: 'How is it that any one individual, although 'composite', i.e. consisting of many parts is a unity rather than a plurality?...How is that two or more individuals (even if qualitatively indistinguishable) can be counted – each counting exactly as one – and therefore be distinguished?'.

role of the principle of individuation, in different respects: the form by guaranteeing the unity and self-identity of the individual, the matter by making each individual different from the others. The form is the principle that unifies many parts into a single whole for the constitution of a single individual, while matter is the principle that allows one to distinguish many individuals that are qualitatively the same.

In the light of these conceptual distinctions, we are in the position to say that *Met* V 6, and in particular the first section 1015b17-36, Aristotle follows two lines of investigation. The composite resulting from a substance and its accident is first examined from the point of view of the resulting whole and its intrinsic structure, and afterwards from the point of view of its constituents. Following the first line, Aristotle is interested, from the point of view of ontology in what is the principle of individuation of accidental composites, and from the point of view of language in what is the monadic use of the predicate 'being one *per accidens*'. Following the second line, he is interested, from the point of view of ontology in what is the principle in virtue of which two or more items they are accidentally identical,[63] and from the point of view of language in whether there is a count name that applies to them together.

By contrast with the interpretation I am suggesting along the lines of Popper's remarks on the principle of individuation, other modern commentators, e.g. White and Kirwan in the early Seventies, find precisely in this section of *Met* V 6 reasons for claiming that Aristotle is not able to keep clearly distinct the question of the intrinsic unity of a single item from the question of the identity between numerically distinct items.[64] In his interpretation White explains Aristotle's confusion between the monadic and the dyadic use of the predicate 'being one *per accidens*' as due to the ambiguity of all sentences of the form 'X and Y are one' (occurring e.g. at 1015b17-

[63] Cp *Met* V 9, 1017b27-1018a4 and commentary *ad locum*.

[64] White (1986: 184-7): 'Aristotle doesn't mark the contrast, but it is initially tempting to say that...we can distinguish between a one-place use and a two- (or more-) place use...When we look more closely, we see that it is not very sharp at all in his examples...There are some signs, then, that Aristotle is not keeping separate the use of 'X and Y are one' to mean that they are in some way identical from its use to say that they make up an unitary entity.' Kirwan (1971: 113-5): It appears at first as if the discussion of coincidental unity deals with type 2 questions [*sc.* questions of the form 'what are the conditions under which *x* and *y* are one and the same thing, and not different things?']: for e.g. 'Coriscus' and 'the artistic' can be used as designation of the *same* thing, and Aristotle actually slips into talking of sameness at b27. But the appearance is misleading. b23 says that the artistic and Coriscus are one 'because one coincides in the other'; these items, then, are regarded by Aristotle as different things, whose relationship of coinciding combines them into a kind of unity.'

18 and 19-20), which may mean 'X is (in some respect) identical to Y' but also 'X and Y together constitute something of a certain kind'.[65]

White (1986: 189-97) reconstructs a broader framework for the questions about unity that Aristotle addresses in *Met* V 6, which he sees as part of Aristotle's response to Plato's position on the identity through time of the Ideas. For White the question Aristotle wants to address is this: Given any item X (whether it is universal or particular) taken into consideration in two different moments in time $t_1$ and $t_2$, what is the principle in virtue of which X at $t_1$ and X at $t_2$ are identical? In modern terms the question may be formulated also thus: are X at $t_1$ and X at $t_2$, taken as segments of a spatio-temporal *continuum*, parts of the same *continuum* or not? If we express Aristotle's position in response to this question using the same modern terminology and concepts, it amounts to saying that X at $t_1$ and X at $t_2$ are two different things, for they are different segments of the spatio-temporal *continuum*, and yet they are in a sense the same thing, *qua* parts (segments) of the very same spatio-temporal *continuum*, which is itself one. White finds what Aristotle says about identity in *Met* V 6 sound if applied to the issue of identity through time of substances, but inadequate to explain whether, given an entity X at time t seen from two different viewpoints $v_1$ and $v_2$, $X(v_1)$ and $X(v_2)$ are the same thing or not.

By contrast, Code claims that Aristotle's solution to the question of the identity of substances through time can be extended to also answer the question of their identity at one given time, on the basis of the following reasoning. Given two segments of a spatio-temporal *continuum*, they are one in a two-places use of the predicate 'to be one', if they overlap with each other, and they are one in a one-place use of the predicate 'to be one', if they overlap with the same spatio-temporal *continuum*. In both cases it is a necessary condition for identity that either one of the two segments is a portion of the other (namely that the spatio-temporal *continuum* overlaps with the one or the other segment),[66] or that both segments are a portion of

---

[65] White (1986: 184-7): 'I want to focus [upon sentences of the form 'X and Y are one'] since my hypothesis is that Aristotle is led into serious difficulties largely, though not exclusively, by an ambiguity of such sentences. One may take 'X and Y are one' either to mean that X is somehow identical with Y', that they are the same thing of a sort, or else that they *together make up* one thing (of a sort) which has them as its constituents...He does not explicitly distinguish the one-place and the two-place uses of 'one' there are cases where one- and two-place seem interchangeable' (italics in the original).

[66] For instance one of the two segments is 'the artistic' and the other is Coriscus, and the spatio-temporal continuum is Coriscus.

the same *continuum* (namely neither of the two segments overlaps with the entire *continuum*).[67] Given these assumptions, the temporal limits of the segments provide the criteria for distinguishing identity in time from identity through time: if the limits coincide, the identity between the segments is only at a given time; if the limits do not coincide at all the identity between the segments is only through time; if the limits coincide only partially there is identity at a given time only for the temporal interval in which the limits coincide.

To recapitulate the conclusions of the line of interpretation held, in a variety of versions, by White, Kirwan and Code, Aristotle is not able to keep distinct the notions of monadic and dyadic unity; for, he confuses two different temporal perspectives, the diachronic and the synchronic ones. In answer to the criticism that these interpreters move against Aristotle, it has to be noted that, at least in *Met* V 6, which is the main text in which the interpreters find Aristotle supposedly confused, there is no mention of any temporal parameter. Hence, it does not seem appropriate to accuse him of a temporal perspectives' mistake, for temporal perspectives in fact are not even in play in *Met* V 6.

What is the ontological status of those things, e.g. τὸ μουσικόν, that for Aristotle count as 'one *per accidens*' according to the classification in *Met* V 6? There is first of all disagreement to be registered among modern interpreters on the meaning of the expression Aristotle uses, which is the neuter nominalized adjective. There is a line of interpretation, held for instance by Mignucci and Williams,[68] according to which the referent of the neuter nominalized adjective is an ontologically simple item, e.g. a person identified through a particular description – through one of its accidental properties, e.g. her being musical. According to other commentators however, for instance Lewis and Matthews,[69] the nominalized adjective in the neuter denotes an ontologically complex item, namely the accidental composite constituted by a substance and one or more accidents belonging to it. This is what Matthews

[67] For instance one of the segments is 'the artistic' and the other is 'the just' and the *continuum* is Coriscus.

[68] Mignucci (1985: 57-97), and also Williams (1985: 63-80). Williams suggests understanding all Aristotelian expressions made out of the neuter nominalized adjective as Russellian definite descriptions. For Williams, as much as Russellian definite descriptions do not denote anything by themselves, but contribute to the meaning of the sentence in which they appear in virtue of their intrinsic predicative structure, so the neuter nominalized adjective does not denote directly anything, but has an accidental descriptive content.

[69] Lewis (1982: 85-140), and also Matthews (1982: 223-40).

calls a 'kooky object'. Matthews speculates that Aristotle develops this 'kooky object doctrine' in answer to sophistic arguments based on possible ambiguities in the use of terms like 'one' and 'identical', and to epistemic paradoxes debated at the time.[70]

The main difference between the two lines of interpretation is the following. If the nominalized adjective in the neuter refers to the substance by itself, then the adjective appearing in the nominalized expression and any other predication that has the nominalized adjective as a logical subject are in fact predicated of one and the same ontological subject, which is one in being (ταὐτὰ κατὰ τὴν οὐσίαν)[71] but under two or more descriptions. On the other hand, if the nominalized adjective refers to the accidental composite as a whole, then there will be only incidental identity (but difference in being) between the subject to which the adjective appearing in the nominalized expression belongs to and the subject of the predications.

I find reasons to embrace the interpretative suggestion made by Lewis and Matthews in my reading of *Met* V 6, 7 and 9. In my view in the first section of *Met* V 6, 1015b17-36, which is parallel to the first section of V 9, 1017a7-22, Aristotle discusses the ontological status of accidental composites. An accidental composite can be defined, along the lines of Lewis' suggestion, through the primitive relation of composition between to different types of being '*per se*',[72] namely a substance and an accident, which originate a trans-categorial 'being *per accidens*'.[73] Furthermore, in the constitution of an accidental composite there are two relations in play, which are expressed, respectively, by the predicates 'being one *per accidens*' and 'being

---

[70] Matthews quotes for example *Met* VI 2, 1026b15-8: 'For the arguments of the sophists deal, we may say, above all with the accidental; e.g. the question whether 'musical' and 'lettered' are different or the same, and whether 'musical Coriscus' and 'Coriscus' are the same, and whether 'everything which is, but is not eternal, has come to be', with the paradoxical conclusion that if one who was musical has come to be lettered, he must also have been lettered and have come to be musical, and all the other arguments of this sort; the accidental is obviously akin to non-being'.

[71] The equivalence between substance (οὐσία) and being (τὸ εἶναι) is found in many passages in Aristotle's works; see Bonitz *Index* 544a26-38.

[72] See *Met* V 7, 1017a22-30.

[73] Matthews calls this trans-categorial being a 'kooky' object. A kooky object is constituted by items belonging to different categories and does not belong itself to any category. It depends on the ontological level on the substance that constitutes it together with the accident, and cannot be a subject, at the linguistic level, of other predicates, but only indirectly, in virtue of its constituent substance. Matthews (1982: 224-5): 'Aristotle's picture of an accidental unity is that of an ephemeral object – an object whose very existence rests on the accidental presence, or com-presence, of some feature, or features, in a substance. Accidental unities exist, he supposes, only in a accidental sense of the verb 'to be' that they can say to be (*Metaph.* VI 2)...Aristotle suggests that standard definite descriptions like 'the musical man' and 'the man in the corner' pick out kooky objects...For ourselves, we suppose that, in a suitable context, the expression 'the musical man' might simply pick out Coriscus, and that the expression 'the man in the corner' might simply pick out Socrates'.

identical with *per accidens*'. An accidental composite has a complex intrinsic structure, whose unity depends on the fact that an accident belongs to a substance and thereby constitutes something which is one (in a monadic sense). An accidental composite is 'identical *per accidens*' with the substance on which it depends ontologically, however it is not 'identical *per se*' neither to the substance nor to the accident (or accidents) that constitute it.[74] Furthermore, an accidental composite may also be one with something else (in a dyadic sense).

There are various ways in which an accident may belong to the substance in constituting accidental composites. Both in *Met* V 6 and 7, Aristotle considers two cases: the one in which an accident is predicated of a substance and the one in which an accident is predicated of an accident and only indirectly of a substance.[75] From these two cases, four types of accidental unity can be derived: i) substance and accident; ii) accident and accident; iii) (substance and accident) and (substance and accident); iv) (substance and accident) and substance.

The first type is the fundamental one, as Ross (1924: I 301) also notes, and all the others can be reduced to it, even in the case in which there are only two accidents involved. For, the ontological status of the accident is such that it is always predicated of a subject, and it can be a subject of the predication of another accident only if both accidents involved belong to the same substance – otherwise an infinite regress in the chain of predications would be generated, as Aristotle argues in *Met* IV 4.[76]

---

[74] This way of understanding accidnetal composites finds confirmation, as Matthews (1982: 225) notes, also in the fact that the generation and destruction of an accidental composite or kooky object do not coincide with the generation and destruction of the substance form which the composite is constituted...In this context [*sc.*: *Phys.* I 7, 190a17-21] the not-musical is the not-musical *person* (rather than non-musicality) and 'the unmusical' is the unmusical person. What Aristotle is telling us is that, when the man becomes musical, the man survives but each of these kooky objects perishes: the not-musical (one), the unmusical (one), the unmusical man'.

[75] In *Met* V 7, 1017a21-2, Aristotle mentions also the case in which the substance is predicated of an accident (e.g. 'the artistic is a man'). This type of predication is called in modern term un-natural, for the grammatical subject of the sentence does not coincide with the logical subject. Already Asclepius (*In Met* 313, 34), among the ancient commentators, notes that, given a substance and an accident, they may be predicated of each other κατὰ φύσιν ἢ παρὰ φύσιν, namely with the grammatical subject coinciding with the grammatical one, or with the two not coinciding.

[76] *Met* IV 4, 1007b2-13: 'For an accident is not an accident of an accident, unless it be because both are accidents of the same subject. I mean, for instance, that the white is musical and the latter is white, only because both are accidental to man. But Socrates is musical, not in this sense, that both terms are accidental to something else. Since then some predicates are accidental in this and some in that sense, those which are accidental in the latter sense, in which white is accidental to Socrates, cannot form an infinite series in the upward direction; e.g. Socrates the white has not yet another accident; for no unity

Aristotle adds a corollary at 1015b28-34, in which he considers the case in which the subject of the predication of an accident is a genus or a universal:[77] the resulting composite is analysable either in terms of 'direct' composition of the genus (or universal) and the accident (e.g. 'Man is musical') or in terms of the belonging both of the genus (or the universal) and the accident to a third thing, namely the individual substance (e.g. 'Coriscus is a man and musical'). As Aristotle notes, however the latter case is not perfectly analogous to the one in which two accidents belong to a single substance, for the genus is intimately involved in the determination of the substance, while the accident is only a state (ἕξις) or affection (πάθος) of the substance.[78]

---

can be got out of such a sum. Nor again will 'white' have another term accidental to it, e.g. 'musical'. For this is no more accidental to that than that is to this.

77 Among the modern commentators, Dumoulin (1991: 179) makes the point that in this passage Aristotle uses with the term καθόλου, instead of εἶδος, meaning 'species', for he wants to use exclusively the term εἶδος to mean 'form'. *Contra* Dumoulin however, in the same chapter, e.g. at 1016a18, εἶδος clearly refers to the species (τὸ ὑποκείμενον τῷ εἴδει εἶναι ἀδιάφορον). The term εἶδος appears elsewhere too in the *Metaphysics* to have two possible referents: e.g. in III 3, 998b13-23, it means 'species' and in 4, 999b16-7 it means 'form'.

[78] For the meaning of ἕξις and πάθος in *Met* V, see chap 20 (in particular 1022b10-2) and 21 (in particular 1022b15-19) respectively. Since Aquinas (*In Met* lib V, lec 7 [847], 230), the explanation of the two terms is standardly given is that ἕξις is an accident that persists in the subject, and πάθος is a temporary affection of the subject.

## 1. Oneness *per se*

The notion of 'being one *per se*' is discussed in the section 1015b36-1016b6 in *Met* V 6; three accounts are given:[79]

i) Oneness by continuity, 1015b36-1016a17:
τῶν δὲ καθ' ἑαυτὰ ἓν λεγομένων τὰ μὲν λέγεται τῷ συνεχῆ εἶναι
Of things that are called one in virtue of their own nature some are so called because they are continuous.

ii) Oneness in substratum, 1016a17-32:

ii.i) material substratum, 1016a17-24:
ἔτι ἄλλον τρόπον ἓν λέγεται τῷ τὸ ὑποκείμενον τῷ εἴδει εἶναι ἀδιάφορον·
Things are called one in another sense because their substratum does not differ in kind;

ii.ii) genus, 1016a24-32:
λέγεται δ' ἓν καὶ ὧν τὸ γένος ἓν διαφέρον ταῖς ἀντικειμέναις διαφοραῖς
Those things also are called one whose genus is one though distinguished by opposite *differentiae.*

iii) Oneness by indivisibility, 1016a32-b6:

iii.i) indivisibility in notion:
ἔτι δὲ ἓν λέγεται ὅσων ὁ λόγος ὁ τὸ τί ἦν εἶναι λέγων ἀδιαίρετος πρὸς ἄλλον τὸν δηλοῦντα [τί ἦν εἶναι] τὸ πρᾶγμα
Two things are called one, when the definition which states the essence of one is indivisible from another definition which shows us the other.

iii.ii) indivisibility in general, 1016b3-6:
ὅλως δὲ ὧν ἡ νόησις ἀδιαίρετος ἡ νοοῦσα τὸ τί ἦν εἶναι, καὶ μὴ δύναται χωρίσαι μήτε χρόνῳ μήτε τόπῳ μήτε λόγῳ, μάλιστα ταῦτα ἕν, καὶ τούτων ὅσα οὐσίαι·

---

[79] Ross notes that the three accounts Aristotle gives of 'being one *per se*' may be grouped according to a different criterion, by taking the first one as concerning oneness in quantity (τῷ ποσῷ) and the other two concerning oneness in quality (τῷ εἴδει). Reading the text in this way highlights the parallelism between it and *Met* X 1, in particular 1052a34-5.

In general those things the thought of whose essence is indivisible, and cannot separate them either in time or in place or in definition, are most of all one, and of these especially those which are substances.

As all the commentators have noted, this section of *Met* V 6 shows apparent parallelism with X 1, 1052a19-b1:

i) Oneness by continuity, 1052a19-21; this section corresponds *verbatim* to *Met* V 6, 1015b36-1016a17, namely to this first account of 'being one *per se*'

ii) Oneness by complete realisation of the form, 1052a22-8; this section corresponds to V 6, 1016b11-17, namely to the last lines of the summary Aristotle gives of the arguments given in the whole section concerning 'being one *per se*'

iii) Oneness by indivisibility, 1052a29-b1; this section corresponds to V 6, 1016a32-b6, notwithstanding some differences, the most significant of which is that in X 1 Aristotle introduces a further distinction between indivisibility in number and indivisibility in form.

In *Met* X 1 uniqueness of substratum is not mentioned as a criterion for 'being one *per se*', but in its place we find oneness by complete realisation of the form (1052a22-3: ἔτι τοιοῦτον καὶ μᾶλλον τὸ ὅλον καὶ ἔχον τινὰ μορφὴν καὶ εἶδος, μάλιστα δ' εἴ τι φύσει τοιοῦτον καὶ μὴ βίᾳ).

I proceed in the following sections to discuss each of the accounts of oneness *per se* in *Met* V 6 in turn.

### 2.1 Oneness by continuity

In *Met* V 6, 1015b36-1016a17, Aristotle first offers examples of things that are said to be 'one *per se*' because of their continuity. The first two examples are cases of dyadic oneness (a bundle of things tied together; two wooden planks glued together) and the other two of monadic oneness (a bent line; an organic body with different parts). Aristotle distinguishes different degrees of oneness, depending on whether the continuity is by nature (φύσει) or man-made (τέχνῃ).[80] Oneness by continuity is defined by Aristotle in terms of sameness of movement: in Aristotle's words, a body made out of different parts counts as one if its natural movement is such that the different parts necessarily move with one and the same movement.[81] In this context, Aristotle explains sameness of movement in terms indivisibility in time; at 1016a5-6 we read:

> συνεχὲς δὲ λέγεται οὗ κίνησις μία καθ' αὐτὸ[82] καὶ μὴ οἷόν τε ἄλλως· μία δ' οὗ ἀδιαίρετος, ἀδιαίρετος δὲ κατὰ χρόνον.
>
> A thing is called continuous which has by its own nature one movement and cannot have any other; and the movement is one when it is indivisible, and it is indivisible in respect of time.

This remark is to be understood in the light of other passages in the *Physics* (e.g. V 4, 227b27-35, and VIII 8, 262a1-5) where Aristotle claims that movement is one if the following three conditions are satisfied: the thing in movement is one, the place where the movement happens is one, and the time at which the movement takes place is one.

Aristotle offers a definition[83] of what it means to be continuous in *Phys* V 3, 227a11-13; all the commentators refer to it as a text difficult to square with *Met* V 6:

---

[80] The same distinction is found in *Met* X 1, 1052a19-21.

[81] Another context in which Aristotle accounts for oneness in terms of oneness of movement is *Phys* V 4, 228a12-23: 'Since every motion is continuous, a motion that is one in an unqualified sense must (since every motion is divisible) be continuous, and a continuous motion must be one'.

[82] καθ' αὐτὸ here means simply 'due to the nature of the thing'. See Bonitz, *Index* 728a46-8.

λέγω δ' εἶναι συνεχὲς ὅταν ταὐτὸ γένηται καὶ ἓν τὸ ἑκατέρου πέρας οἷς ἅπτονται, καὶ ὥσπερ σημαίνει τοὔνομα, συνέχηται.

A thing that is in succession and touches is 'contiguous'. The 'continuous' is a subdivision of the contiguous: things are called continuous when the touching limits of each become one and the same and are, as the word implies, contained in each other.

Commentators have found the criterion for continuity at work in *Met* V 6 at odds with the one in *Phys* V 3. The exegetical approach favoured by ancient and medieval commentators is to add to what Aristotle says in the various passages on the topic of continuity appropriate qualifications which render all the passages part of a coherent and unified doctrine. By contrast, modern commentators, since Bonitz, acknowledge the variety of claims Aristotle makes on the same topic, and explain them in terms of what the context of investigation is in each case.

Among those who follow the first approach, the ancient commentators Alexander (*In Met* 363,16ff.) and Asclepius (*In Met* 324, 15ff.) take Aristotle to use the term 'continuous' in *Met* V 6 occasionally in a loose way, with a generic meaning (κοινότερον), which allows even a bundle to be continuous, by contrast with the proper meaning (κυρίως) of the term as it is used in *Phys* V 3. The same distinction is to be found in some medieval commentaries, e.g. the one by Albert the Great.[84] By contrast, Aquinas introduces a different distinction between what is continuous in virtue of its intrinsic structure (*continua secundum se*), and what is continuous in virtue of something else (*continua secundum aliud*).[85] In the later Scholastic tradition, the interpreters introduce other various distinctions, in an attempt to give consistency to the Aristotelian texts. For instance Paul of Venice attributes to Aristotle both the distinction between *continua secundum se* and *continua secundum*

[83] In the *Physics* passage Aristotle indeed prefaces what he is going to say about the meaning of being continuous with the formula λέγω δὲ, which is for him a technical expression to introduce a definition.

[84] Albert the Great (*In Met* lib V tr 1°, c. 7, 223-4) comments thus: 'Continua autem dicuntur communiter quocumque modo ad unum copulata...Continuum vero in natura unum dicitur, cuius motus, qui secundum se finis est, est unus...Hic autem est, sicut in his que *De principiis motum animalium* disputavimus, qui est ab immobili uno'.

[85] Aquinas (*In Met*, lib V, l. 7, [849-853], 231): 'Sed continua dicuntur aliqua dupliciter. Quaedam enim sunt continua...per aliud, quaendam secundum se'.

*aliud* (which actually comes from Aquinas), and also the distinction between *secundum se reflexa* and *secundum se non reflexa*, which he makes up himself.[86] Furthermore, Paul integrates what he takes to be Aristotle's own position with Averroes analysis of it. So Paul integrates in the Aristotelian account four more ways of being continuous suggested by Averroes: *per ligamen*, *per conglutinationem*, *per indivisibilitatem*, *per motum*; the first two man-made and the other two by nature, the fourth being proper to celestial bodies.[87] Finally, concerning the type of continuity that celestial bodies enjoy, Paul adds a further distinction between two meanings of the notion of 'common limit', namely the limit that two contiguous things share: the common limit may be intrinsic or extrinsic to the nature of the things that are contiguous, thereby defining two more types of continuity.

On the other traditional line of interpretation, followed e.g. by Bonitz, Ross and more recently Dubois,[88] the discrepancies between different Aristotelian texts, and in particular between the criteria for continuity at work in *Met* V 6 and *Phys* V 3, are to be solved by reconstructing different contexts of investigation that explain why Aristotle holds different positions. According to this interpretation, in *Met* V 6 the definition of being continuous is simply not an issue, for there Aristotle is concerned only with classifying different ways in which something can be 'one *per se*' and being continuous is just one of those. The investigation of what it means to be continuous is rather to be found in the *Physics*.

---

[86] Paul of Venice (*In Met*, ff. 61rb-vb **M**, 173va-174ra **Pv**): 'Contra predicta movet Philosophus dubium, probans quod nec fasciculum lignorum neque animal est continuum secundum se per diffinitionem continui, que est quod continuum est illud cuius motus est unus secundum se...Pro solutione huius difficultatis Aristoteles ponit duas distinctiones de continuo, quarum prima est hec: quedam sunt continua secundum se et quedam sunt continua secundum aliud...Secunda distinctio est quod terminorum secundum se quedam sunt reflexa, et quedam non sunt reflexa...Ex hiis distinctionibus habetur solutio difficultatis, nam diffinitio continui est intelligenda de continuo secundum se, et non de continuo secundum aliud, et non est intelligenda de continuo habente reflexionem, sed de continuo non habente reflexionem'.

[87] Averroes *In Met*, lib V, tr. 1°, c. 6, t. c. 8E-K, f. 111rb-vb. See also Paul of Venice, *In Met*, ff. 61vb-62ra **M**, 174ra-b **Pv**.

[88] Bonitz (*In Met*, 235): 'Notionem continui subtilius exponit Phys. V 3, notione motus, quae non necessario cogitatur in notione continuitatis, non adscita...Eiusdem libri proximo capite V 4 subtilius definit qui motus sit unus...Hoc loco, ubi unitatem motus non ipsam explicat, sed ad definiendam continuitatem adhibet, in diffinitione minus accurata acquiescit'. Ross (1924: I, 302): 'The continuous is better defined in *Phys* V 3 without reference to movement, which is not really an element in the notion'. Dubois (1998: 58-9): 'Si l'on se reporte au chapitre de la Physique où Aristote définit par comparaison le contact, le contigu et le continu (V, 3), on remaquera que, à la différence du texte V, le continu est défini sans référence au mouviment. Il semble d'ailleurs que, pour Aristote, le mouvement n'est pas en soi un élément de cette notion'.

A different position from all the others is Kirwan's, who notes that in *Met* V 6 Aristotle uses the term 'continuous' with three different meanings (1016a1: continuous in virtue of contact between the parts; 1016a5: continuous in virtue of sameness of movement of the parts; 1016a7: continuous in virtue of one's own nature). Kirwan complains and there is not enough evidence for us to understand what connections Aristotle sees between them.

> Aristotle mentions, perhaps intentionally, more than one definition of 'continuous'...This definition [*sc.*: in *Phys.* V 3, 227a11-13] is echoed in the distinction at 1016a7 between 'continuous in its own right' and 'in contact'; but at a1 a bundle, whose parts are merely in contact, is called continuous. a5 interposes yet a third definition: 'that whose change in its own right is one and cannot be otherwise...But Aristotle gives no rules for distinguishing these cases ...It is hard to see what arguments would count for or against these proposals, but we can certainly object to his connection between them (1971: 302).

In answer to Kirwan's comment I propose to read 1016a5 as a sketchy presentation of the generic account of continuity Aristotle wants to use in this chapter, and to read the two other passages as referring to different degrees of continuity (higher for things that are continuous *per se* and lower for things that are continuous by contact). As my own contribution to the traditional debate on the discrepancy between Aristotle's definition of the continuity in terms of sharing a physical limit in common (*Phys* V 3) and in terms of moving in virtue of a single movement (*Met* V 6), I suggest that in *Met* V 6 there is indeed no definition of continuity. Aristotle appeals there just to common sense understanding, and intentionally avoids defining properly what being continuous amounts to. The reason why he does this, I take it, is not to introduce in the context of the investigation on oneness further philosophical issues. The main difference between the reading that most interpreters agree on and the one that I suggest in the viewpoint form which I propose to examine the question of the relation between *Met* V 6 and *Phys* V 3. From my point of view, there is no contraposition between two different definitions of continuity. Rather, Aristotle in *Met* V 6 substitutes the definition of continuity given in *Phys* V 3, which is not free from difficulties (as Aristotle may be aware), with a simpler, intuitive account, which facilitates his primary purpose of investigating oneness. In support of the interpretation I put forward, I make some more general remarks on first of all

Aristotle's conception of continuity. I take as the first textual evidence to consider *Phys* VI 2, 233a24-6:

> διχῶς γὰρ λέγεται καὶ τὸ μῆκος καὶ ὁ χρόνος ἄπειρον, καὶ ὅλως πᾶν τὸ συνεχές, ἤτοι κατὰ διαίρεσιν ἢ τοῖς ἐσχάτοις.
>
> For there are two senses in which length and time and generally anything continuous are called 'infinite': they are called so either in respect of divisibility or in respect of their extremities.

As Wieland argues (1962: 351-99), in Aristotle's metaphysics there is a single notion of *continuum* which has two fundamental aspects expressed, the one by the definition of the *continuum* in terms of parts sharing a common limit (see e.g. *Cat* 6, 5a1-14, *Met* X 12, 1069a5-8, and *Phys* V 3, 227a11-13) and the other by its definition in terms of its divisibility *ad infinitum* (see *Phys* III 1, 200b20 and VI 1, 231a24 and 231b12ff; VI 2, 232b25). The two definitions give different but complementary descriptions of the *continuum*. The first describes the *continuum* from the point of view of its constituents and their mutual relations, and gives the conditions under which a multiplicity of things is together a *continuum*, and can be individuated as one something.[89] The second definition takes the point of view of the *continuum* as a whole and describes its internal structure: saying that it is divisible *ad infinitum* amounts to saying that it is not composed by any indivisibles, as Aristotle puts it in *Phys* VI 1, 231b12. The description of the *continuum* that Aristotle gives in the *Physics* is however problematic for two reasons. Firstly, it is circular, as Wieland has already pointed out (1993: 69). The *continuum* is defined by the divisibility of the parts which are in their turn continuous and that can be individuated only one in relation to the other, for their limit by definition is common. Furthermore, the definition of common limit seems to have more appropriate application to mathematical rather than physical entities.[90] For, in the case of a continuous

[89] In this case the common limit is not any more an actual limit, but at most a potential one.

[90] This is a point of disagreement between Ross (1936: 70) and Wieland (1993: 366, n 53); I find more persuasive Ross' arguments than Wieland's. Ross thinks that 'The firmness with which he rejects any suggestion that a line can be divided without remainder into points, a period of time into moments, or a movement into infinitesimal jerks – and this at a time when thinkers of repute believed in all these things – seems to me to indicate that he had a more mathematical turn of mind than he is usually credited with'.

mathematical entity, one can think of the internal limit common to the constituent parts as a limit in potentiality – so that the unity of the entity as a whole is not compromised. By contrast, in the case of physical entities, in Ross' words (1936: 69), 'two things cannot strictly speaking be continuous, since an extreme of one thing cannot be identical with an extreme of another thing alongside of it in the space'. Assuming that Ross is right, this is a further discrepancy between the definitions of the *continuum* in the *Physics* and in *Met* V 6, for in the latter the *continuum* is described by reference to oneness of movement, which is to be understood as movement of a rigid *body*. This means that Aristotle is thinking there of a physical, rather than a mathematical model.

Recapitulating the two main differences between the *Physics* and the *Metaphysics* accounts of the continuum, in my view in the *Physics* Aristotle provides a proper definition of the *continuum* and refers to a mathematical model, whilst in the *Metaphysics* he offers only an intuitive description and refers to a physical model. In the light of these considerations, one can conclude that they are two different definitions, which I suggest is not legitimate to compare on the grounds of more or less accuracy. On the interpretation I suggest in *Met* V 6 Aristotle introduces a different, more intuitive account for the *continuum*, by reference to movement, for the reasons given above; notwithstanding the fact that the type of movement that accounts for continuity in *Met* V 6 is supposed to be itself continuous – which is a *petitio principi*.[91]

Finally, it remains to clarify the observation that Aristotle makes in the last part of the section of *Met* V 6 under examination. Aristotle takes a geometrical line as an example of something that is one, on the ground that it is continuous. With reference to that example he observes at 1016a12-7 that different degrees of oneness can be distinguished according to the fact that the line is straight or bent, but also he adds a *prima facie* puzzling remark, namely that the bent line is one and not one at the same time:

---

[91] See *Phys* V 4, 228b1-8: 'Motion, therefore, that is in an unqualified sense continuous and one must be specifically the same, of one thing, and in one time. Unity is required in respect of time in order that there may be no interval of immobility, for where there is intermission of motion there must be rest, and a motion that includes intervals of rest will be not one but many, so that a motion that is interrupted by stationariness is not one or continuous, and it is so interrupted if there is an interval of time'.

καὶ ἡ εὐθεῖα τῆς κεκαμμένης μᾶλλον ἕν· τὴν δὲ κεκαμμένην καὶ ἔχουσαν γωνίαν καὶ μίαν καὶ οὐ μίαν λέγομεν, ὅτι ἐνδέχεται καὶ μὴ ἅμα τὴν κίνησιν αὐτῆς εἶναι καὶ ἅμα· τῆς δ' εὐθείας ἀεὶ ἅμα, καὶ οὐδὲν μόριον ἔχον μέγεθος τὸ μὲν ἠρεμεῖ τὸ δὲ κινεῖται, ὥσπερ τῆς κεκαμμένης.

> And the straight line is more one than the bent; but that which is bent and has an angle we call both one and not one, because its movement may be either simultaneous or not simultaneous; but that of the straight line is always simultaneous, and no part of it which has magnitude rests while another moves, as in the bent line.

To understand what Aristotle means, we should think as Kirwan also suggests (1971: 135-6) that everything, in so far as it is something, is something one, and in this sense to predicate of something that it is one is just to say in a sense that is what it is, according to what Aristotle says e.g. in *Met.* X 2, 1054a13-9:

> That the one, then, in every class is a definite thing, and in no case is its nature just this, unity, is evident; but as in colours the one-itself which we must seek is one colour, so too in substance the one-itself is one substance. That in a sense unity means the same as being is clear from the facts that its meanings correspond to the categories one to one, and it is not comprised within any category (e.g. it is comprised neither in 'what a thing is' nor in quality, but is related to them just as being is); that in 'one man' nothing more is predicated than in 'man' (just as being is nothing apart from substance or quality or quantity); and that to be one is just to be a particular thing.

From this point of view, something can be an *x*, e.g. a bent line, and yet be at the same time a multiplicity of *y*s, e.g. the segments that constitute the bent line, namely can be one and yet have a complex intrinsic structure.

## 2.2 Oneness in substratum

The second account of 'being one *per se*', namely oneness in substratum, is discussed by Aristotle in the second section of *Met* V 6, 1016a17-32, which has two sub-sections, the first beginning at 1016a17 on oneness in material substratum, and the second beginning at 1016a24 on oneness in genus. The close connection between these two sub-sections has been noted, among modern commentators, by Ross (1924: I 302), Kirwan (1971: 137), and Duminil and Jaulin (1991: 172), on the basis of different textual evidence. Ross notes that at 1016b8-9, the section which contains a brief recapitulation of the topics already discussed, Aristotle mentions only three criteria for 'being one *per se*' (namely continuity, oneness in species and indivisibility in notion),[92] and that in the transition in the text between oneness in material substratum to oneness in genus at 1016a24 there is no use of the formula ἔτι, which Aristotle uses throughout *Met* V to space out different items in the series of accounts he gives for each notions. Kirwan, in support of the thesis of the close conceptual connection between oneness in material substratum and oneness in genus, quotes *Met* V 28, 1024b8-9, where Aristotle takes matter and genus as equivalent in the following respect:

> 'Genus' then is used...as matter; for that to which the differentia or quality belongs is the substratum, which we call matter.[93]

---

[92] *Met* V 6, 1016b8-9: τὰ δὲ πρώτως λεγόμενα ἓν ὧν ἡ οὐσία μία, μία δὲ ἡ συνεχεία ἢ εἴδει ἢ λόγῳ·

[93] Bonitz (*Index* 798a59-b1) takes the two passages from *Met* V 6 and 28 as offering examples of the very same meaning of ὑποκείμενον, which he defines as 'genus quasi material per differentias determinatur'. Aristotle's commitment to the equivalence of genus and matter would require futher investigation, which cannot be carried out within the limits of the present work. It would also require reference to Aristotle's theory of definition in the central books of the *Metaphysics*. In a very brief outline, the background to the claim that matter and genus are equivalent is Aristotle's claim that the thing to be defined and its definition are isomorphic. Each definition is a formula, and a formula has parts, so that by isomorphism the thing defined must have parts too. The question is whether the formulas that express the parts of the thing defined are included in the formula that expresses the thing as a whole, hence whether it is necessary to find what makes the thing defined and the definition one and many at the same time, namely what is their unifying principle. Within the framework of the traditional model of definition by genus and species, the question becomes how to explain how genus and differentia, which are distinct elements, jointly constitute a unified definition. Aristotle tackles this problem at different points, providing different solutions at different times (see e.g. *Met* VII 12, 1038a5-9 and VIII 3, 1043b10-3). Finally in *Met* VIII 6 he proposes to assimilate matter and genus on the one hand, and differentia and form on the other, so that the unity of the definition reflects and expresses the unity of substance.

In the light of these considerations, oneness in species and oneness in genus may be regarded as both involving oneness in substratum, in the former case the material substratum, in the latter the substratum of specific differences.

On the basis of the classification proposed by Aristotle, two (or more) things are said to be 'one *per se*' first of all because their material substratum does not bear specific differences (at least detectable by the senses).[94] There are two possible cases. In the one case, a mass term such as e.g. water is said to be 'one *per se*' (in a monadic sense), for no perceptible differences can be detected in its proximate substratum, or in other words the substratum is macroscopically homogeneous. While in the other case two or more entities such as e.g. oil and wine and all the other liquids[95] are said to be 'one *per se*' (in a dyadic sense) because they have a common ultimate substratum, or in other words they are homogeneous only at a microscopic level.

Furthermore some things are said to be 'one *per se*' because they fall under the same genus; we could say they share the same genus, even though diversified by opposite specific *differentiae*. Aristotle gives two accounts of how the genus plays the role of unifying principle: 'one *per se*' on the one hand, at 1016a24-9, the ultimate species which fall under the same genus, on the other, at 1026a29-32, the sub-determinations of a genus which belong to the same genus and furthermore belong to it in virtue of the very same properties. The distinction between two accounts is clear from the examples given by Aristotle: horse, man and animal fall under the same genus, which is animal, but they are different in species; by contrast isosceles and equilateral not only fall under the same genus, which is figure, but also they do so in virtue of the very same properties, because they are both triangles.

There is reason to think that the section of the chapter in which the second sense of 'being one *per se*' is introduced is textually corrupted; hence, it has been amended by the editors. The most interesting textual issue is about the expression τὸ

[94] Precisely this reference to sensible perception runs out the possibility that the substratum here mentioned could be understood as prime matter, for prime matter, as Aristotle says *Met* VII 3 is not perceptible, for it does not have any sensible property.

[95] Aristotle uses the terms in this example οἱ χυμοὶ and τὰ τηκτά, (literally what can be liquefied). For the assumption that the ultimate substratum of all that can be liquefied is water, see e.g. *Met* V 4, 1015a10, and V 24, 1023a28-9. For the assumption that in particular oil and wine are a mixture of water and air, and water and earth respectively, see e.g. *Meteor* V 5 and 10, in particular 388a34-b11.

ἀνωτέρω τούτων at 1016a30.[96] The editors disagree over the authenticity of this expression: Ross prints it as part of the text but marks it as dubious, whilst Jaeger, following Christ, wants to expunge it. Let us suppose, by hypothesis, that τὸ ἀνωτέρω τούτων is part of the text; how should we understand it? Both Ross (1924: I 303) and Kirwan (1971: 137) take it as epexegetically connected to τὸ ἄνω γένος at 1016a29.[97] In the example that Aristotle gives τὸ ἀνωτέρω τούτων, namely the higher genus, is 'figure', its sub-genus is 'triangle', and the *infimae species* are 'isosceles' and 'equilateral'. What does the pronoun τούτων refer to? There are two possibilities: it refers either to the *infimae species* (isosceles and equilateral) as Kirwan understands it, or to the sub-genera (triangle and other subgenera of figure) as Ross understands it. Ross's explanation is the following:

> "Sometimes they are said to be the same in respect of the higher genus (if they are *infimae species* of their genus), viz. of the genus above the genera of which the proximate genus is one". τὸ ἀνωτέρω τούτων, which it seems best to read with Alexander, is epexegetic of τὸ ἄνω γένος and τούτων it seems, must mean the proximate genus and its co-ordinate genera; otherwise ἀνωτέρω τούτων would have to mean not 'above these' but 'higher above these', which it cannot mean'.

By contrast Kirwan's explanation is this:

> "The genus above is called the same": i.e. *x* and *y* are the same *G* if both of them are *F* and *G* is the genus of *F*. "If they are the last forms of the genus" seems to stipulate (i) that '*x*' and '*y*' mark places for form- (i.e. species-) descriptions rather than proper names and (ii) that the species be the *infimae species* of *x* and *y*. It is not clear why either of these conditions is necessary. "That which is further above these" may be a gloss and must in any case explicate 'the genus above', sc. *G*. If these are the last forms, i.e. *x* and *y*,

---

[96] There are a few more variations in the edition of the text to be mentioned, but they do not substantially change the way to read it. By contrast with Ross' edition, which I take as point of reference, Jaeger adds the plural genitive ὧν at 1016a28 (for Alexander reads the text in this way, and by analogy with 1018a6 and 1018a29, and the declarative conjunction ὅτι at 1016a29 9by analogy with 1016a23, 1016a26 and 1015b29). Furthermore, Jaeger reads τὰ instead of τὸ at 1016a30, rejecting the correction that Bonitz had proposed and Ross accepted on the basis of Alexander's commentary. In my view it is preferable to read Ross' text, which is the closest to the manuscripts tradition, and makes good sense without the interventions proposed by Jaeger.

[97] Kirwan (1971) actually translates the passage as if τὸ ἀνωτέρω τούτων was part of the text, although it mentions in a footnote to the translation (37) and in the commentary (137) that the authenticity of the expression has been questioned.

"further above" must mean 'at one remote above'. The Greek word, the comparative of 'above' need not mean so much (it can be a synonym for 'above'), but Ross's claim that it "cannot mean" 'higher above' seems rash. If he is right, "these" must refer, as he says, to F and its co-ordinate genera.

Neither Ross's nor Kirwan's reading is however fully satisfactory. For it seems unlikely that the comparative ἀνωτέρω would be used to express 'two-levels higher' and most probably is used loosely to mean just 'higher'. This is the weakness of Kirwan's interpretation. It is equally unlikely though that τούτων refers to other sub-genera of 'figure' which are not mentioned, and that in any case would not have any argumentative function. This is the weakness of Ross's interpretation. If then both interpretations according to which the expression τὸ ἀνωτέρω τούτων is part of the genuine Aristotelian text appear to be ruled out, it is plausible to take this expression as a gloss, which is indeed a possibility that Ross and Kirwan too take into consideration and Jaeger very strongly supports. If it is a sort of note added by some reader, then it might have been made up on the line of reasoning that Ross too suggests, namely as a reminder of the fact that τὸ ἄνω γένος, namely figure, is the proximate genus of triangle and other types of plain figures. Notwithstanding the textual difficulties just mentioned, the point Aristotle is making in the passage is anyway clear: of the two senses in which two or more items can be said to be 'one *per se*' in virtue of their oneness in genus, the stricter sense may be clarified by a comparison between the following examples:

| (General schema) | (Example 1) | (Example 2)[98] | (Example 3)[99] |
|---|---|---|---|
| Genus | Animal | Animal | Plain Figure |
| \| | \| | \| | \| |
| Sub-genus | Mammal | Mammal | Triangle |
| \| | \| | \| | \| |
| *Infimae* species | Man | Horse, Man, Dog | Isosceles, Equilateral |
| \| | \| | | |
| Individuals | Socrates, Plato | | |

[98] See *Met* V 6, 1016a27.
[99] See *Met* V 6, 1016a30-2.

Two individuals belonging to the same *infima* species (Socrates and Plato, ex. 1) are 'one *per se*' in a strict sense because they fall under the same genus (Animal), and they fall under the same genus *via* the fact that they fall under the same species (Man). In the same way, two *infimae* species belonging to the same sub-genus (Isosceles, Equilateral, ex. 3) are 'one *per se*' in a strict sense because they fall under the same genus (Plain Figure), and they fall under the same genus *via* the fact they fall under the same sub-genus (Triangle). In other words, Socrates and Plato fall under the genus Animal because they are both men, hence they are 'one *per se*' in a strict sense; analogously, isosceles and equilateral fall under the genus Figure because they are are both triangles, hence they are 'one *per se*' in a strict sense. It has to be noted that the Isosceles and the Equilateral are not specific differences of the genus Figure. If they were, they would be sub-genera of Figure, rather than, as they are, differences of Triangle. This is proven by the fact that being equilateral does not imply being a triangle (e.g. a square is also equilateral) but only being a plain figure. In this sense the case of triangles is different from the case of animal species (ex. 2): Horse, Man and Dog belong to the same genus above them (Mammal) each in virtue of its own specific differences. In this case then being for instance a horse implies being a mammal and at a higher level being an animal, according to the standard model of definition that Aristotle adopts for instance in *Met* VII 12.

### 2.3 Indivisibility

The third sense of being 'one *per se*' introduced at 1016a32-b6 concerns those entities whose definition is the same. Here are Aristotle's words at 1016a32-4:

> ἔτι δὲ ἓν λέγεται ὅσων ὁ λόγος ὁ τὸ τί ἦν εἶναι λέγων ἀδιαίρετος πρὸς ἄλλον τὸν δηλοῦντα [τί ἦν εἶναι] τὸ πρᾶγμα
>
> Two things are called one, when the definition which states the essence of one is indivisible from another definition which shows us the other.

Some preliminary textual remarks are necessary. Ross and Jaeger agree in expunging [τί ἦν εἶναι] at 1016a34. Furthermore Jaeger *ad locum* notes that in the commentary by Alexander of Aphrodisias (*In Met* 366: 9-10) there is no references to the expression τὸν δηλοῦντα [τί ἦν εἶναι] τὸ πρᾶγμα; nevertheless Jaeger does not think we should take the passage as interpolated. In support of retaining the aforementioned line in the original text e.g. Duminil and Jaulin (1991: 173) note that the verb δηλόω is often used by Aristotle, especially in the *Topics* (e.g. V 4, 133a6; VII 3, 140a34; VIII 2, 152b39) precisely to to mean 'to give the definition of something'.

The section of the chapter we are examining may be divided into three parts, which start respectively at 1016a32, 1016b1, 1016b3.

The first part (1016a32) concerns the indivisibility in notion between two entities, where indivisibility is here to be understood as lack of distinction from something else, and hence as indivisibility in a dyadic sense. Aristotle gives two examples of things that are 'one *per se*' in a dyadic sense in virtue of having undistinguishable notions: what is subject to growth and what is subject to diminution, and two or more plain figures of the same type having different dimensions. In both cases, the entities in the examples are distinguishable in virtue of the fact that they have more or less matter (intelligible matter in the case of geometrical entities, see *Met* X 3, 1054b3-7), but this is only an accidental not an essential feature of theirs.

In the second part, 1016b1-3, Aristotle is concerned with the topic of different degrees of indivisibility, hence of oneness. The individual is what enjoys the highest degree of indivisibility, for it is the object of a single act of intellection and has a unique location in space and time.

In the third part, 1016b3-6,[100] Aristotle recapitulates in general terms the notion of indivisibility that has been put at work so far in the chapter – which is different, as we will see in a moment, from the one that is at work in the second part of chapter, 1016b17-1017b3.

Before coming to it, Aristotle gives in the rather heterogeneous section 1016b6-17 a series of remarks which partially repeat what he has already said in the previous sections of the chapter devoted to 'being one *per accidens*' and 'being one *per se*'. Two sub-sections may be distinguished. The first mentions a series of accounts of 'being one *per se*' and 'being one *per accidens*', some of which were already introduced in the first part of the chapter (1015b16-1016b6), along with various accounts of what it means to be many, which Aristotle will discuss later in the chapter at 1017b3-6. [101] The second sub-section presents two main senses in which something may be said to be 'one *per se*', explains the relevant criteria, and offers an example for each case.

In the beginning of the first sub-section (1016b6-8) Aristotle mentions four accounts of accidental unity. Many things are 'one *per accidens*' if they do (ποιεῖν), possess (ἔχειν), are affected by (πάσχειν) or are related to (πρός τι εἶναι) something which is one. The first three however describe a metaphysically weak type of unity and have no correspondence with the accounts of 'being one *per accidens*' Aristotle gives in this chapter at 1015b16-34 (nor with the various accounts of 'being *per accidens*' in *Met* V 7, 1017a7-22). Only the fourth account may be taken as referring

[100] I take this part of the chapter connected with the two previous ones, even though thematically it might seem to be more connected with the general recapitulation Aristotle gives at 1016a6-17, because of the presence of γὰρ (1016b4) which clearly indicates that the following sentence is connected to the preceding one.

[101] The first sub-section is introduced by οὖν which usually introduces a consequence and a conclusion of what has just been said before. Despite this linguistic indicator, from a conceptual point of view however the list of accounts of 'being one *per se*' and 'being one *per accidens*' does not follow or derive neither from the passage immediately preceding (where Aristotle discusses oneness because of indivisibility) nor from the previous part of the part of the chapter, for , as I will show more in detail later, there is no precise correspondence between the various accounts discussed in the previous part of the chapter and the ones mentioned in the summary. The commentators have not offered solutions to this difficulty. Among the modern interpreters, Kirwan (1971: 138) for instance describes 1016b6-11 as puzzling, but does not offer exegetical suggestions.

to the fact that all types of accidental unity may be reduced to the inherence of one or more accidents to one substance, according to what Aristotle says also in *Met* V 7, 1017a19-22. At 1016b8-9 Aristotle proceeds to claim that to be one in the primary sense (πρώτως) means to be one κατὰ τὴν οὐσίαν, i.e. to have one and the same substance. Interestingly, Aristotle further differentiates three criteria for sameness of substance: continuity (συνεχείᾳ), which I take as material continuity, hence oneness in substratum; species or form (εἴδει); definition (λόγῳ).[102] There is clearly only a loose correspondence between this and the previous part of the chapter (1016a17-32). However, there is also a strong parallelism between this part of *Met* V 6 and X 1, where oneness in form / species is also mentioned as a criterion for 'being one *per se*' (1052a22-8). Finally, in the last part of this sub-section (1016b9-11) Aristotle mentions three meanings of 'being many', defined by contraposition to the previous three accounts of 'being one *per se*'.

In the second subsection (1016b11-7)[103] Aristotle briefly summarizes the two main meanings of 'being one *per se*' which correspond to two different degrees of unity. There is a rather generic sense in which anything may be said to be one provided that it has a continuous quantity of matter, and another sense, which is more fundamental, in which only what is a whole, i.e. has its own form fully realised, is one (1016b12-3). The first case is illustrated by Aristotle with the example of the

---

[102] Mignucci (1985:57-97) suggests that identity and unity in being (κατὰ τὴν οὐσίαν) between two items may be understood in two ways. Saying that two given items are identical in being, may mean either that the linguistic expressions that denote them have the same sense or that they have the same reference. On the first account, two given items are identical in being if they are denoted by linguistic expressions which have the same sense. On the second account, two given items are identical in being if they are denoted by linguistic expressions that refer to things that have the same definition, namely that are one in species and in number. Mignucci quotes *Met* V 6, 1016b9-11, as an example of the latter case. He takes Aristotle to be saying that on the assumption that items that have one definition are 'one *per se*', hence one in being and denoted by linguistic expressions having the same sense, then items that are denoted by expressions having different senses cannot be one in number. Mignucci takes Aristotle's expression ἀριθμοῦμεν ὡς πλείω at 1016b10 to mean 'we consider distinct in number'. This interpretation however is not consistent e.g. with *Met* V 6, 1016b32-3, where Aristotle reduces oneness in number to oneness in material substratum. *Contra* Mignucci, it gives better sense to read Aristotle's expression in a distributive way. Namely, for each of the criteria given (continuity, oneness of form, oneness of definition) whatever does not satisfy the criterion is a multiplicity. Aristotle does not commit himself here to say which, if any of those, is the criterion which determines plurality in number.

[103] In the very beginning of this sub-section, ἔτι instead of ἐπεὶ is a correction by Bonitz (*In Met* 237) on the basis of the manuscript **T** (which is considered very authoritative) and Alexander of Aphrodisias' conjecture (*In Met.* 368, 7-15). Ross and Jaeger *ad locum* edit the text following Bonitz. By contrast Schwlegler (1847: 209-10) does not want to substitute ἐπεὶ with ἔτι on the ground that ἔτι usually, and especially in *Met* V, has the specific function of introducing a new meaning for the term under examination, but no new meaning is introduced at 1016b11.

parts of a disassembled shoe that are randomly disposed although contiguous in space; the second with the example of a circular line.[104] Wholeness (ὅλον) is explained by Aristotle in terms of oneness in form; this crucial tenet emerges also in the following parallel passages (my italics):[105]

i) *Met* V 6, 1016b11-17:

While in a sense we call anything one if it is a quantity and continuous, in a sense *we do not unless it is a whole, i.e. unless it has unity of form*; e.g. if we saw the parts of a shoe put together anyhow we should not call them one all the same (unless because of their continuity); we do this only if they are put together so as to be a shoe and to have already a certain single form. This is why the circle is of all lines most truly one, because it is whole and complete.

ii) *Met* V 26, 1023b27-36:

For (a) that which is true of a whole class and is said to hold good as a whole (which implies that it is a kind whole) is true of a whole in the sense that it contains many things by being predicated of each, and by all of them, e.g. man, horse, god, being severally one single thing, because all are living things. *But (b) the continuous and limited is a whole, when it is a unity consisting of several parts, especially if they are present only potentially, but, failing this, even if they are present actually.* Of these things themselves, those which are so by nature are wholes in a higher degree than those which are so by art, as we said in the case of unity also, wholeness being in fact a sort of oneness.

iii) *Met* X 1, 1052a22-8:

*That which is a whole and has a certain shape and form is one in a still higher degree*; and especially if a thing is of this sort by nature, and not by force like the things which are unified by glue or nails or by being tied together, i.e. *if it has in itself the cause of its continuity*. A thing is of this sort because its movement is one and indivisible in place and time; so that evidently if a thing has by nature a principle of movement that is of the first kind (i.e. local movement) and the first in that kind (i.e. circular movement), this is in the primary sense one extended thing.

---

[104] Kirwan (1971: 139) comments on this example by Aristotle by noting that a straight line would be not less complete, formally, than a circular one, according to what Aristotle himself says in *Met* V 16. Contra Kirwan's remark though, in *Phys* VIII 9 (in particular 265a28-b1) movement along a circular line is said one and continuous, whilst movement along a straight line is not. Heath (1970: 206) notes that the same characterization of the circular line as continuous given by Aristotle e.g, in *Meteor* III 3 373a4-5 is given by Euclid I Def 15.

[105] I limit myself to a synoptic presentation of the passages, for I cannot examine the issue in more depth in this context.

From the comparison between the passages just quoted, it appears that wholeness and oneness in the highest degree in fact characterise substances, as Aristotle claims in *Met* V 6, 1016b3, because i) their matter is quantitatively determined and continuous; ii) their form is one, hence the parts are present only in potentiality and subordinate to the form of the whole; iii) the union of matter and form is by nature, and not artificially created, for the substance has in itself the principle of its own unity.

### 3. The one as a count principle

The second part of *Met* V 6 covers two topics: what it is to be a count principle (1016b17-1017a3), and what the various meanings of the term 'many' are (1017a3-6). In the very beginning (1016b17-8) of the section devoted to the one as count principle, the text is unfortunately corrupted. I will first of all briefly consider how the modern editors Ross, Jaeger, and also Schwgler in the XIXth century resolve this difficulty:

**T 1** τὸδὲ ἑνὶ εἶναι ἀρχῇ τινί ἐστιν ἀριθμοῦ εἶναι (Ross)

**T 2** τὸδὲ ἑνὶ εἶναι ἀρχὴ <τοῦ>τινί ἐστιν ἀριθμῷ εἶναι (Jaeger)

**T 3** τὸδὲ ἑνὶ εἶναι ἀρχὴ τινί ἐστιν ἀριθμοῦ εἶναι (Schwegler)

The two main differences between the editions just quoted are about the variants: ἀρχῇ (**T 1**) and ἀρχὴ (**T 2** and **T 3**); ἀριθμοῦ (**T 1** and **T 3**) and ἀριθμῷ (**T 2**). The variants chosen in **T** 1 are based on the manuscript $\mathbf{A}^{b}$ and are accepted by the majority of the modern commentators. The text, if read in this way, gives the following sense:

- 'To be one is to be a starting point of number' (Ross)
- 'To be one is a kind of origin of number' (Kirwan)
- 'L'essenza dell'uno consiste nell'essere un principio numerico (Reale)
- 'L'essence de l'Un est d'etre une sorte de principe numérique' (Dubois)

The variants printed in **T 2** are more widely attested in the manuscripts (**E**, **J** and **Γ**). The reading ἀρχὴ finds support in Alexander's commentary (*In Met* 368, 15-6) and also in the analogy between this case and the other two occurrences of the same term at 1016b19 and 20. The insertion of <τοῦ> is justified by Jaeger on the basis of the consideration that being one is being the principle of any number. Modern commentators translate the line thus:

- 'Being one is the origin of being a certain number' (Kirwan)
- 'L'être de l'un est d' être principe d'un nombre quelconque' (Duminil and Jaulin)

Finally, **T 3** finds support in Asclepius' commentary (*In Met* 316, 4). Schwegler offers the following translation for it:

- 'Das Einseyn ist Prinzip des Zahlseyin'

Schwegler's interpretation is very close to Jaeger's. It is plausible that Jaeger might have agreed with Schwegler's interpretation, but found **T 3** a text difficult to read (literally translated it would mean: 'the being of the one is for anything being principle of number'). Motivated by Schwegler's understanding of the passage, Jaeger might have wanted to reconstruct a text, **T 2**, which gives the same sense as **T 3**, but where the sense is more perspicuous to the reader.

According to what text one reads, two different interpretations of what Aristotle says are possible:

**I 1** (reading **T 1**): being one is to be a certain kind of count principle
**I 2** (reading **T 2**): being a number is to be the principle of a certain kind of number

If one accepts Ross' text, understood according to **I 1**, then the first claim in Aristotle's argument is that the one is a count principle only in a certain sense (τινί). This could mean two things: either that the one is a count principle in the sense that Aristotle specifies a few lines later in this chapter and also in *Met* X 1,[106] namely the one is principle of knowledge of any quantity, for measuring is counting *n* times the chosen unit; or that the one is the origin of number only in a certain sense, because it is at the beginning of the series of numbers, but it is not itself a number (see e.g. in

[106] *Met* X 1, 1052b20-4: 'For measure is that by which quantity is known; and quantity *qua* quantity is known either by a 'one' or by a number, and all number is known by a 'one'. Therefore all quantity *qua* quantity is known by the one, and that by which quantities are primarily known is the one itself; and so the one is the starting-point of number *qua* number'.

*Met* XIV 1).[107] In fact, in *Phys* IV 12, 220a27-8, Aristotle says: 'The smallest number, in the strict sense of the word 'number', is two'.

If, on the other hand, one reads Jaeger's text, understood according to **I 2**, the one is the origin of the number, in one of its meanings. Aristotle distinguishes two meanings of the term 'number' (see e.g. *Phys* IV 11, 219b5-7): number is both what is counted / countable and that with which we count. The relevant meaning for the point made in *Met* V 6 is 'what is counted / countable'.

Let us now consider the overall argument that Aristotle is putting forward in the passage where the controversial text belongs to. The argument may be reconstructed in three steps: i) the one is the unit of any measurement;[108] ii) the unit of measurement is that in virtue of which we know; iii) the one therefore is principle of knowledge.[109]

Counting is possible only when there is available a count name N that is attributed to an item *x* if and only if *x* falls under the concept C expressed by N, and *vice versa* of any item *x* that falls under the concept C it must be true that *x* is a N. The determination of the unit of measurement and of the appropriate count name is relative to the type of items that one wants to count.[110] For, for Aristotle every number is the number-of-something (see *Met* XIV 5, 1092b19-20), in two senses. A number depends, for its existence and definition, on that which is counted, for each number is defined by the unit of measurement taken *n* times, and the unit of measurement is defined in its turn as a part, however small one wishes, of what is to be measured. In other terms, a unit of measurement may be chosen arbitrarily but must be homogeneous with that which it is a measurement of, and it is precisely in virtue of this relation of homogeneity that the unit of measurement is the principle of

---

[107] *Met* XIV 1, 1088a6-8: 'Thus it is natural that one is not a number; for the measure is not measures, but both the measure and the one are starting-points'. See also Annas (1976:39). By contrast, for an argument to the effect that within Aristotle's doctrine the one and the zero are numbers, see Jones (1972: 110-3).

[108] For the same point see also *Met* V 15, 1012a12-3; X 1, 1052b16-19; XIV 1, 1087b33-4.

[109] See also the definition of 'principle' that Aristotle gives in *Met* V 1, in particular at 1013a14-5: ἔτι ὅθεν γνωστὸν τὸ πρᾶγμα πρῶτον, καὶ αὕτη ἀρχὴ λέγεται τοῦ πράγματος.

[110] See e.g. *Met* XIV 5, 1092b19-20: 'The measure must always be some identical thing predicable of all the things it measures, e.g. if the things are horses, the measure is 'horse', and if they are men, 'man'. If they are a man, a horse, and a god, the measure is perhaps 'living being', and the number of them will be a number of living beings. If the things are 'man' and 'pale' and 'walking', these will scarcely have a number, because all belong to a subject which is one and the same in number, yet the number of these will be a number of 'kinds' or of some such term.' For Aristotle's claim that numbers are always numbers-of-something, by contrast to the Platonic conception of numbers as separate entities, see Annas (1976: 357), Hussey (1983: 176-84), Jones (1972: 111-2).

knowledge of what is measured.[111] It is now clear what Aristotle means at 1016b20-3:

> ἀρχὴ οὖν τοῦ γνωστοῦ περὶ ἕκαστον τὸ ἕν. οὐ ταὐτὸ δὲ ἐν πᾶσι τοῖς γένεσι τὸ ἕν. ἔνθα μὲν γὰρ δίεσις ἔνθα δὲ τὸ φωνῆεν ἢ ἄφωνον· βάρους δὲ ἕτερον καὶ κινήσεως ἄλλο.
>
> The one, then, is the beginning of the knowable regarding each class. But the one is not the same in all classes. For here it is a quarter-tone, and there it is the vowel or the consonant; and there is another unit of weight and another of movement.

On the reconstruction of Aristotle's argument I am suggesting, ll. 1016b17-8 make better sense in Ross' edition, reading ἀρχῇ as qualified by τινί: the one is not a number, but is the unit for measurement of numbers. The unit of measurement must satisfy two conditions: it has to be homogeneous with what it measures, as I have discussed so far, and it has to be assumed as indivisible, as Aristotle says at 1016b23-4. There is an important difference between the notion of indivisibility Aristotle uses in this part of the chapter, and the one that he makes use of to define the third account of 'being one *per se*' in the previous part of the chapter. The unit of measurement is indivisible in an absolute sense; by contrast the entities that are 'one *per se*' are indivisible only in a relative sense. An item *x* is indivisible in an absolute sense in case there is no principle of division internal to *x* that allows *x* to be divided in parts that are called themselves *x*. This notion of indivisibility is well exemplified in *Cat* 5, 3b10-3 with reference to the primary substances (as mentioned in chapter 1):

> Every substance seems to signify a certain 'this'. As regards the primary substances, it is indisputably true that each of them signifies a certain 'this'; for the things revealed is individual and numerically one.

An item *x* is indivisible only in a relative sense in case it is divisible in parts which maintain the same name as the whole, but do not derive from an internal principle of division in *x*. For example: the species 'Man' is indivisible in an absolute

[111] See *Met* X 1, 1053a24-7: 'The measure is always homogeneous with the thing measured; the measure of spatial magnitudes is a spatial magnitude, and in particular that of length is a length, that of breadth a breadth, that of articulate sound an articulate sound, that of weight a weight, that of units a unit.'

sense because there is no divisive intrinsic difference which allows the species 'Man' to be divided in sub-species which maintain the denomination 'man'; but it is divisible in a relative sense, for there are individual men, in which the species may be conceptually divided, who maintain the denomination 'man'.

In *Met* V 6, 1016b23-4, Aristotle adds that what is indivisible in an absolute sense is indivisible either according to quantity or according to form.[112] This latter criterion, namely the qualitative one, is introduced so that there can be a unit for measurement for movement too, as Kirwan (1971: 139) too points out. In *Phys* V 4 we read that each movement is quantitatively divisible, hence the unit for measuring movement, which for the principle of homogeneity has to be itself a movement, is divisible according to a quantitative criterion, but is indivisible according to a qualitative criterion.[113] In *Met* V 6 Aristotle only mentions the two criteria for indivisibility, and to illustrate qualitative indivisibility offers the example of: the unit, the point, the line, the surface and the solid (1016b24-31). These geometrical entities are ordered according to their degree of divisibility in one or more directions (or no direction at all, like in the case of the unit and the point)[114] according to the same classificatory system Aristotle uses in *De Caelo* I 1, 268a7-8[115].

To briefly recapitulate, in the first section (1016b17-31) of the second part of *Met* V 6, Aristotle characterises the essence of the one as being a unit of measurement, homogeneous with what is measured and intrinsically indivisible; hence principle of knowledge of reality. By means of the appropriate unit of measurement, it is possible to identify what is measured, by similarity with something that is already known, i.e. the unit of measurement, and classifying it under a count name and a universal concept. Measuring is for Aristotle a fundamental

[112] See also *Met* X 1, 1053a18-20: 'Thus, then, the one is the measure of all things, because we come to know the elements in the substance by dividing the things either in respect of quantity or in respect of kind'.

[113] *Phys* V 4, 227b20-228a20: 'Motion is one in an unqualified sense when it is one essentially or numerically: and the following distinctions will make clear what this kind of motion is. There are three classes of things in connexion with which we speak of motion, the 'that which', the 'that in which', and the 'that during which'. I mean that there must he something that is in motion, e.g. a man or gold, and it must be in motion in something, e.g. a place or an affection, and during something, for all motion takes place during a time. Of these three it is the thing in which the motion takes place that makes it one generically or specifically, it is the thing moved that makes the motion one in subject, and it is the time that makes it consecutive: but it is the three together that make it one without qualification.'

[114] What differentiates the unit from the point is that the unit has no position in space, the point does.

[115] *De Caelo* I 1, 268a7-8: Μεγέθους δὲ τὸ μὲν ἐφ' ἓν γραμμή, τὸ δ' ἐπὶ δύο ἐπίπεδον, τὸ δ' ἐπὶ τρία σῶμα·

epistemological process. But, if this reading is correct, the way Aristotle's line of argumentation continues in the following section of the chapter (1016b31-1017a3) seems not to follow a coherent development. Aristotle seems to conclude the discussion by introducing various types of oneness: i) oneness in number, ii) oneness in species, iii) oneness in genus and iv) oneness by analogy. The text allows two interpretations: Aristotle is presenting either different ways of counting or different accounts of being one, in the sense of being identical (ταὐτὸ). On the former reading, what Aristotle is saying here is part of the preceding argument; on the latter, the order of exposition seems not to correspond to the line of reasoning Aristotle is following: why do we find here another series of types of oneness? To address this exegetical problem I will first give a fuller explanation of the two possible interpretations, then weigh their plausibility also in the light of other textual evidence, and finally show the variety of conclusions that different commentators at different times have derived from the passage. As a preliminary sample, Ross (1924: I 340) for instance highlights the correspondences between this section and the previous parts of the chapter. Dubois holds that this is a crucial passage where Aristotle claims the equivalence between to be and to be one.[116] By contrast, Kirwan believes this section does not tie in with the rest of the chapter, and Dumoulin even suggests that the section is a summary of the previous part of the chapter and not originally part of the text.[117]

The first possible interpretation of the passage is that the four accounts of 'being one' Aristotle introduces at 1016b31-1017a3 correspond to different ways of counting, namely different ways of identifying the unit: in relation to matter, species, genus, analogy. This interpretation fits well in the framework of Aristotle's philosophy of mathematics; for, for Aristotle the unit of measurement is an ordinary physical entity which is taken, arbitrarily, to be indivisible for the sake of being the unit for measurement.[118] From this perspective, Aristotle's exposition follows a

---

[116] Dubois (1998: 178): 'On ne considérara donc pas le paragraphe 1016b31-1017a3 comme intrusive, à la manière de Kirwan (p. 139); il montre au contraire, comment les catégories de l'être sont aussi catégories de l'un, puisque l'ordre et la structure interne de ces catégories dépendent de leur degré de divisibilité.'

[117] Kirwan (1971: 139): 'This paragraphe seems intrusive. The senses it lists are, unlike many many which have preceded, all senses in which 'one' means 'the same'...not 'single''. Dumoulin (1991: 180): 'Le dernier paragraphe (1016b31 et suiv.)...semble postérieur (car il reprend dans une nouvelle énumération le genre et l'espèce qui figuraient plus haut).'

[118] See e.g. *Met* XIV2, 1089b34-1090a2, and also Annas (1976: 37).

coherent thread. He first describes in general terms what a unit of measurement is, and then gives different accounts of it, which ground different ways of counting. There is a natural connection between the sections 1016b17-31 and 1016b31-1017a3; furthermore the latter is well placed as a conclusion of that part of the chapter, 1015b16-1017a3, that concerns oneness, for it recapitulates some of the accounts of 'being one *per se*' which have been discussed before (oneness in substratum and in species), and introduces two new accounts, oneness in genus[119] and oneness by analogy.

On the second possible interpretation, the various types of unity mentioned in the section 1016b31-1017a3, express relations of identity between two or more items; Aristotle is here examining the notion of identity, following the same classification of meanings in *Met* V 9, 1018a5-9, and X 1, 1054a32-b3. This is why the section appears not to tie in with the second part of *Met* V 6. On this reading, this passage should rather be interpreted in the light of evident similarities with other passages of the *Metaphysics* on the same topic:

*Met* V 6, 1016b31-1017a3:
Again, some things are one in number, others in species, others in genus, others by analogy; in number those whose matter is one, in species those whose definition is one, in genus those to which the same figure of predication applies.

*Met* V 9, 1018a5-9:
Some things ... are the same by their own nature, in as many senses as that which is one by its own nature is so; for both the things whose matter is one either in kind or in number, and those whose essence is one, are said to be the same. Clearly, therefore, sameness is a unity of the being either of more than one thing or of one thing when it is treated as more than one, i.e. when we say a thing is the same as itself; for we treat it as two.

*Met* X 3, 1054a32-b3:
'The same' has several meanings; (1) we sometimes mean 'the same numerically'; again, (2) we call a thing the same if it is one both in definition and in number, e.g.

[119] Here genus to be understood as the highest genus, as in *Phys* VII 1, 242a67-242b42, where Aristotle introduces, in relation to movement, a classification of types of identity analogous to the one in *Met* V 6 (in the *Phys* only the account of oneness by analogy is missing). Identity in genus is explained by Aristotle at 242b35 thus: '[something] is generically the same if it belongs to the same category, e.g. substance or quality'.

you are one with yourself both in form and in matter; and again, (3) if the definition of its primary essence is one; e.g. equal straight lines are the same, and so are equal and equal-angled quadrilaterals; there are many such, but in these equality constitutes unity.

The close similarity between the three passages above suggests that the passage in *Met* V 6 is to be interpreted as a brief discussion on the topic of identity, rather than as a further step in the argument Aristotle has started developing in the section 1016b17-31. Aristotle is listing various meanings of 'one', taken in the sense of 'identical *per se*' rather than various ways of counting. On this interpretation, it remains to be analysed now what are the various meanings of 'being one' in the sense of 'being identical':

i) oneness in number

ἔτι δὲ τὰ μὲν κατ' ἀριθμόν ἐστιν ἕν... ἀριθμῷ μὲν ὧν ἡ ὕλη μία

ii) oneness in species

τὰ δὲ κατ'εἶδος... εἴδει δ' ὧν ὁ λόγος εἷς

iii) oneness in genus

τὰ δὲ κατὰ γένος... γένει δ' ὧν τὸ αὐτὸ σχῆμα τῆς κατηγορίας

iv) oneness by analogy

τὰ δὲ κατ' ἀναλογίαν...κατ' ἀναλογίαν δὲ ὅσα ἔχει ὡς ἄλλο πρὸς ἄλλο

The first three accounts of oneness are a fundamental three-fold distinction for Aristotle which he defines as early as in *Top* I 7, 103a6-14,[120] where we find:

a) identity in number

ἀριθμῷ μὲν ὧν ὀνόματα πλείω τὸ δὲ πρᾶγμα ἕν

b) identity in species

εἴδει δὲ ὅσα πλείω ὄντα ἀδιάφορα κατὰ τὸ εἶδός ἐστι

c) identity in genus

γένει...ταὐτὰ ὅσα ὑπὸ ταὐτὸ γένος ἐστίν

Regarding (i), interpreters find it difficult to reconstruct a coherent and unified framework for the various definitions of being one in number that Aristotle provides

[120] *Top* I 7, 103a6-14: 'We generally apply the term numerically or specifically or generically-numerically in cases where there is more than one name but only one thing, e.g. 'doublet' and 'cloak'; specifically, where there is more than one thing, but they present no differences in respect of their species, as one man and another, or one horse and another: for things like this that fall under the same species are said to be 'specifically the same'. Similarly, too, those things are called generically the same which fall under the same genus, such as a horse and a man'.

in his works. Two main interpretations have been proposed: on one of them, the different definitions belong to different stages of Aristotle's investigation and signal a development in his views on the topic. On the other interpretation, Aristotle has only one account for what it is to be one in number, and the different formulations are to be explained according to the different contexts in which they are presented.

The first interpretation is supported for instance by Loux (1991: 93), who reconstructs an 'ideal' line of development in Aristotle's thought, in three phases which correspond to the three definitions of numerical oneness:

- in *Top* I 7, 103a9-10: X and Y are one in number iff 'X' and 'Y' denote the same entity even if under different descriptions;
- in *Met* V 6,1016b32-3: X and Y are one in number iff the matter out of which X is composed and the matter out of which Y is composed is the same;[121]
- in *Met* V 6, 1016b1-3: X and Y are one in number iff X's definition and Y's definition are the same.

For Loux, the third is the most fundamental type of identity, the identity that binds together substances and essences according to *Met* VII 6. Whatever is identical in the third sense is also identical in the second and the third. The first and the third definitions are applicable to both particulars and universals. The second definition, which appears on the one hand in *Met* V 6, 1015b16-34 (in the case of accidental unity), and 9, 1017b26-33 (in the case of accidental identity), and on the other in *Met* V 6, 1016b32-1017a3 (in the case of being one *per se*) 9, 1018a-9 (in the case of being identical *per se*), applies only to particular composites.

In the second of the two interpretations mentioned above, supported for instance by Annas (1976: 38-9), the various formulations that Aristotle offers of oneness in number are different uses, in different contexts, of the very same notion. The three main uses concern:

- something being one in the sense of being a particular (see e.g. *Met* II 4, 999b33-1000a1; X 1, 1052a31-32; XII 8, 1074a31-35);
- two things being one in number because of having the same matter (see e.g. *Met* V 6, 1016b32-33; 3, X 1054a33-35);

[121] Sameness number in virtue of sameness in matter includes also the case of things that are the same in genus. Sameness in genus may be *per accidens* (see *Met* V 6, 1015b16-34 and 9, 1017b26-33) or *per se* (see *Met* V 6, 1016b32-1017a3, and 9, 1018a4-9).

- two things being one in number because of having the same form (see e.g. *Met* II 4, 999b21-22; VII 13, 1038b14-16; 16, 1040b17).

Returning to the classification of types of oneness, regarding (ii), i.e. oneness in species, all the commentators understand it along the lines of the third account of 'being one *per se*' in *Met* V, 1016a32-b2.

Regarding (iii), i.e. oneness in genus, interpreters disagree on how to understand the way it is formulated in terms of sameness in the figure of predication. Bonitz (*In Met* 238-9) and Ross (1924: I 304-5), who follows Alexander of Aphrodisias (*In Met* 369, 12-4) hold opposite views. Bonitz has difficulties with Aristotle's claim at 1016b33-4, where genus and category seems to be used as synonyms. Bonitz, following Trendelenburg (1994: 76-81), argues that the expression τὸ σχῆμα τῆς κατηγορίας has in that context a very generic and fundamental meaning: one in genus are those entities that within a single category also belong to the same class among the fundamental classes within that category. E.g. numbers are within the category of quantity and belong to the class of things that are 'either even or odd'. Bonitz believes that the interpretation he puts forward finds supports also in other textual evidence, e.g. in *Met* X 3, 1054b27-1055a2 and 8, 1058a13-6. Ross, in disagreement with Bonitz, claims that the term 'category' in the passage in question in *Met* V 6, 1016b33-4, has its usual meaning. He finds textual support in two groups of texts, one of which gives evidence that the expression τὸ σχῆμα τῆς κατηγορίας means simply 'the category' (see e.g. *Met* V 6, 1017a3; VI 2, 1026a36) and the other evidence that genus is used at times by Aristotle as synonymous with 'category' (see e.g. *Met* V 28, 1024b12-16; *Phys* V 4, 227b4).

Regarding (iv), i.e. oneness by analogy, it makes good sense to take this account as complementary to the previous one. Aristotle is examining what it is to be one on the one hand from an intra-categorical point of view, with oneness in genus as a criterion for being one, and on the other hand from an inter-categorical point of view, with analogy as a criterion which cuts across categories. For instance, 'man' belongs to the category of substance and 'white' belongs to the category of quality. Man and white may be said to be one by analogy (ἄλλο πρὸς ἄλλο) by virtue of the fact that for both we may predicate that they are in potentiality or that they are actualised. This account of what it means to be one by analogy finds support in

different passages in Aristotle's work, e.g. *Met* XII 4 and *EN* I 4.[122] In particular, in *Met* IX 6 Aristotle gives the example of movement and substance as being one by analogy because of both being in actuality.[123]

Finally, Aristotle concludes the section 1016b31-1017b3 by offering a justification for the order in which the accounts of oneness previously discussed have been introduced. The accounts that come later in the order of exposition express stronger types of oneness than the ones that come earlier, meaning that what is one in number is also one in species and in genus; what is one in species is also one in genus, and so on. It is not legitimate though, as Ross notes too (1924: 305), to extend this principle to the case of unity by analogy, for it is a type of unity between items belonging to different categories, hence it would be wrong to say that what is one by analogy is also one e.g. in genus.[124]

---

[122] *Met* XII 4, 1070b16-20: 'These things then have the same elements and principles (though specifically different things have specifically different elements); but all things have not the same elements in this sense, but only analogically; i.e. one might say that there are three principles-the form, the privation, and the matter. But each of these is different for each class; e.g. in colour they are white, black, and surface, and in day and night they are light, darkness, and air'. *EN* I 4, 1096b26-9: But in what sense then are different things called good? For, they do not seem to be a case of things that bear the same name merely by chance. Possibly things are called good in virtue of being derived from one good; or because they all contribute to one good. Or perhaps it is rather by way of a proportion: that is, as sight is good in the body, so intelligence is good in the soul, and similarly another thing in something else'.

[123] *Met* IX 6, 1048b6-9: 'But all things are not said in the same sense to exist actually, but only by analogy-as A is in B or to B, C is in D or to D; for some are as movement to potency, and the others as substance to some sort of matter'.

[124] In the last section of *Met* V 6, 1017a3-6, Aristotle discusses the various meanings of the term 'many', which defined by opposition (ἀντικειμένως, see *Met* V 10, 1018a20-5) to the meanings of the term 'one', where 'one' has to be taken as 'one *per se*'. The nature of such opposition is investigated in depth not in *Met* V 6 but rather in X 3 and 6: it is not an absolute opposition, which would lead to absurd consequences, but rather an opposition between relative terms such as e.g. measure and measurable (see in particular *Met* X 6, 1056b32-1057a1). Here is how Aristotle accounts for the three meanings of 'many' in *Met* V 6:

- things are many because they lack physical continuity
  τὰ μὲν γὰρ τῷ μὴ συνεχῆ εἶναι
- things are many because they fall under different species
  τὰ δὲ τῷ διαιρετὴν ἔχειν τὴν ὕλην κατὰ τὸ εἶδος, ἢ τὴν πρώτην ἢ τὴν τελευταίαν
- things are many because they have different definitions
  τὰ δὲ τῷ τοὺς λόγους πλείους τοὺς τί ἦν εἶναι λέγοντας

# Chapter 3: The Analysis of the Puzzle (II): The Being of an Entity

**Introduction**

The exegetical tradition records two main readings of the structure of *Met* V 7. On the one reading, by the majority of the ancient and medieval commentators, the chapter has to be read as divided into two sections, one about 'being *per accidens*' and the other about 'being *per se*'. On the other reading, first suggested by Alexander of Aphrodisias (*In Met* 370-2) and embraced by the majority of modern commentators, there are four sections in the chapter, one for each meaning of 'being' (τὸ ὄν): 'being *per se*'; 'being *per accidens*'; 'being true' and 'being false'; 'being in potentiality' and 'being in actuality'. I will first highlight the differences between the two interpretative approaches through the analysis of the criteria that the commentators have used to reconstruct the structure of the chapter.

For the first line of interpretation, I will assume as paradigmatic Aquinas's position (*In Met* lib V lec 9), which is held before him also by Asclepius (*In Met* 316-9) and by Averroes (*In Met* 115vb-117vb). Aquinas takes the Aristotelian text to be divided in three sections, of different and increasing length, to indicate the increasing importance of the topic: 1017a7-8; 1017a8-22; 1017b22-b9. The first section consists in the mere mention of the two ways in which something that is (*ens*) may be said to be; it is only introductory and appears to be taken as a section on its own only for the sake of preserving the three-fold structure that Aquinas sees in the text. The second section provides for Aquinas a series of meanings for 'being *per accidens*' (*ostendit quot modis dicitur ens per accidens*), which amount to three types of predication: i) *accidens de accidente*, ii) *accidens de subiecto*, iii) *subiectum de accidente*. The third section provides a series of meanings for 'being *per se*' (*modus entis per se*): i) *ens quod est extra animam*, ii) *ens secundum quod est tantum in mente*, iii) *ens per potentiam et actum*.[125] This last part of the chapter is interpreted by Aquinas as introducing three degrees, in decreasing order, of being and hence of perfection:

[125] The conceptual distinctions that Aquinas uses in interpreting this part of *Met* V 7 (i.e. the distinctions between mental realities and extra-mental realities, between simple and complex items, and between different degrees of perfection) are to be found also in the commentaries by Averroes (XIIth), Albertus Magnus (XIIIth), and later on in the one by Paul of Venice (XIVth).
For example let us consider the section 1017a31-5, in which Aristotle accounts for being true and being false. Albertus Magnus takes it to be the case that 'being true' has two meanings. One concerns the entities '*extra animam and extra sermonem accepta*' and in this case '*veritas rei est ipsa entitatis, quam habet ex sui perfectione*'. The other concerns the objects of thought and language, and in this

i) The first degree of being is the one that extra-mental entities enjoy. Extra-mental entities are to be divided into ten categories.[126] For each category there is a different meaning of the verb 'to be', in its existential as well as copulative use, and three types of predication. Given a subject $x$ and a predicate F, '$x$ is F' is a predication of the first type when the predicate expresses what the subject is (e.g. Socrates is a man); of the second type if the predicate expresses what is 'contained in' the subject, namely what constitutes it and characterises it (e.g. Socrates is white, Socrates is flesh and bones); of the third type if the predicate expresses something extrinsic to the subject (e.g. Socrates is in the Lyceum, Socrates is walking).[127]

ii) The second degree of being is exclusively enjoyed by mental entities, and it is expressed, at the linguistic level, by the composition of the terms in the proposition which corresponds to the composition realised by the intellect.[128] This second way of

---

case '*veritatem compositionis in complexione sermonis*'. See Albertus Magnus *In Met* lib 5, tr 1, c 11, p 234. For Paul of Venice as well 'being true' has two meanings. For the so called extra-mental entities, their being true consists for each thing in being the thing it is 'perfectly', namely in a fully realised way. For the mental entities, their being true consists in the truth of the second operation of the intellect, namely the operation that the intellect performs when it composes or divides. In the case of the extra-mental entities, existing amounts to being perfect and being true, with no further mediation. In the case of mental entities, which are the results of composition or division by the intellect, their being true depends, in a relation of cause-effect, on the being true of the items that are composed or divided by the intellect, which themselves are true, as just said, when they are perfectly realised. See Paul of Venice, *In Met* f. 69rb**M**. Paul of Venice's interpretation is grounded on the distinction, which Averroes is the first to mention in his own commentary and which he attributes to Aristotle, between what it is to be true in the case of simple entities and what it is to be true in the case of complex entities. See Averroes *In Met* 14D-E and 14G-H.

[126] Aquinas' reading of *Met* V 7, 1017a22-7 has been followed by Brentano (1960: 175) and subsequently criticised by Aubenque (1962: 171 note 1), who writes: 'Les categories apparaissent donc ici [*sc.*: *Met.* V 7, 1017a22ff] pour le moins comme les significations privilégiées de l'être, et même comme les seules significations de l'être *par soi*. Ce passage va à l'encontre de l'interprétation de Brentano…qui, systématisant des indications de saint Thomas, fait des catégories autres que l'essence des divisions de l'être *par accident*.' Also (1962: 197 note 1): 'La tentative la plus cohérente en ce sens sera, au XIX$^{e}$ siécle, celle de Brentano, qui, développant certains suggestions de saint Thomas, entraprend de 'déduire' les catégories à partir de la distinction entre être *par soi* (ou essence) et être *par accident* (dont les modalités, ellesmêmes obtenues par division, consituent les autres catégories) …Certes, nous avons vu que la distinction des catégories n'etait rendue possible que par la distinction plus fondamentale de l'être en acte et de l'être in puissance…Mais on ne peut dire pour autant que la seconde distinction soit une *spécification* de la première.' Aubenque moves three objections to Brentano's interpretation. The first is that Aristotle presents the ten categories as various meanings of 'being *per se*', and this rules out the possibility that the categories other than the category of substance are derivable from 'being *per accidens*', but this contradicts Aristotle's position. The second objection is that 'being *per accidens*' cannot be articulated into categories because there is no science of accidents and no way of deriving categories from them. The third objection is that Brentano confuses conceptual distinction and ontological division. The first objection has been raised also by Apelt (1975: 123).

[127] *In Met* lib V, lec 9, [889-92].

[128] *In Met*, lib V, lec 9, [889] and [895]. In other texts however Aquinas distinguishes three levels of reality, with respect to which the second level mentioned in the commentary to *Met* V 7, the level of reality of the mental entities, is divided into two levels. First there is the level of the mental entities

being is less perfect than the previous ones which are enjoyed by the extra-mental entities, for the former is dependent on the latter as an effect on its cause.[129]

iii) The third degree of being concerns being in potentiality and being in actuality, and is interpreted by Aquinas as the way of being of both extra-mental and mental entities.[130] This way of being is defined by Aquinas as *communius quam ens perfectum*, for, at least as far as being in potentiality is concerned, what is in potentiality 'is' only in relation to something else, namely what is in actuality, and thereby in incomplete and imperfect.[131]

From the brief analysis given above of Aquinas' interpretation we can now derive the two criteria that he employs in the reconstruction of the structure of Aristotle's text. Aquinas takes the chapter to be a self-contained text, and highlights its coherence and internal articulation, rather than the connections and the similarities, that are at times difficult to interpret, with other parts of Aristotle's works. In order to satisfy Aquinas' own requirement of systematisation, the Aristotelian text is reconstructed according to criteria of symmetry and hierarchy. The exegetical approach just described and well exemplified in Aquinas' commentary is typical of the commentaries of Asclepius and Averroes as well, and less prominently, also of other commentators intellectually dependent on Aquinas, such as e.g. Siger of Brabant (XIIIth).[132] Aquinas's approach is to be contrasted with the one put forward first by Alexander of Aphrodisias, and shared by the majority of the modern commentators: Bonitz, Maier and Brentano,[133] and subsequently an heterogeneous

---

which have no reality outside the mind (e.g. a chimera), and second the level of the mental entities which do have reality outside the mind (e.g. an abstract entity). See e.g. *Super Libros Sentent.*, dist. XIX, quaest. V, art. I: 'Quaedam enim sunt quae secundum esse totum completum sunt extra animam; et huiusmodi sunt entia completa, sicut homo et lapis. Qaedam autem sunt quae nihil habent extra animam, sicut somnia et imaginatio chimerae. Quaedam autem sunt quae habent fundamentum in re extra animam, sed complementum rationis eorum quantum ad id quod est formale, est per operationem animae, ut patet in universali.'

[129] *In Met*, lib V, lec 9, [896]: 'Sciendum est autem quod iste secundus modus comparetur ad primum, sicut effectus ad causam. Ex hoc enim quod aliquid in rerum natura est, sequitur veritas et falsitas in propositione, quam intellectus significat per hoc verbum Est prout est verbalis copula.'

[130] *In Met*, lib V, lec 9, [897]: 'Et sicut in rebus, quae extra animam sunt, dicitur aliquid in actu et aliquid in potentia, ita in actibus animae et in privationibus, quae sunt res rationis tantum.'

[131] *In Met*, lib V, lec 9, [889]: 'Tertio dividit ens per potentiam et actum: et ens sic divisum est communius quam ens perfectum. Nam ens in potentia, est ens secundum quid tantum et imperfectum.'

[132] Siger of Brabant *Questiones in Metaphysicam* (1981: 298) and *Questiones in Metaphysicam* (1983: 235).

[133] Bonitz, *In Met* 240: 'Hoc quidem capite, quae est universi huius libri ratio, nihil curans quid ipse potissimum esse censeat, unice quot modis τὸ ὂν usurpetur disserit. Quos autem enumerat quattuor entis modos τὸ ὂν κατὰ συμβεβηκὸς 1017a7-22, τὸ ὂν κατὰ τὰ σχήματα τῆς κατηγορίας a22-30, τὸ ὂν ὡς ἀληθές a31-35, τὸ ὂν δυνάμει καὶ ἐντελεχείᾳ a35-b9.' Also, *Index* 221a3ff.: 'Ubi plene

group of analytic interpreters: Ross (1924: I 305ff), Kahn (1966: 245-265; 1971: 323-334; 1986: 1-28), Kirwan (1971: 140ff), Thorp (1974: 238-56), Dubois (1998: 65-72) and Dumoulin (1991: 179-83). I just want to note here, without trying to present the differences in interpretation on particular issues between these commentators, that they all concentrate their exegetical efforts in making sense of the text in relation to other passages in Aristotle's works in which he discusses more extensively the very same themes. Witt's interpretation too follows, in the general lines, the approach of most of the modern commentators, with one difference. She sees Aristotle's text as divided into three sections; for her the first section, 1017a7-30 includes both 'being *per se*' and 'being *per accidens*', by contrast with e.g. Aquinas.[134]

---

enumerator ποσαχῶς λέγεται τὸ ὂν quattuor distinguuntur modi.' Maier (1900: 334): 'In *Met* V 7, wo die 4 Seinsarten kurz zusammengestellt sint'.

[134] Witt's (1989: 38-62) takes the chapter to have three sections, each of which is devoted to one of the following couples of opposite notions: 'being essential' and 'being accidental'; 'being in actuality' and 'being in potentiality'; 'being true' and 'being false'. Witt does not provide arguments in support of her position, but there are two textual points to be mentioned in her support. In the introduction of the chapter Aristotle introduces together the first two ways of being, *per se* and *per accidens*, and does not mention the other two; furthermore while the first two ways of being are opposed to each other, but also united, by the use of the particles μὲν...δὲ, each of the other ways of being is introduced by the particle ἔτι, which suggests more distance so to speak between an item and the other in the list of ways of being.

## 1. The predicative and the existential uses of the verb 'to be'

The traditional interpretation of *Met* V 7 is that in this chapter Aristotle is concerned with different meanings of the verb 'to be'. Interpreters are however divided between those who claim Aristotle is giving a series of meanings of the verb 'to be' in its copulative use, and those who claim that he is giving a series of meanings of the verb in its existential use. I will first reconstruct these two lines of interpretation, and present and evaluate the arguments which have been given in support of each of them. I will show that each of the two lines of interpretation leaves unresolved some exegetical difficulties in Aristotle's text. Hence, there is room for suggesting a new interpretation, which I will develop in the following section, arguing that Aristotle is introducing different entities, rather than different meanings of the verb 'to be', whether in its copulative or existential use. Here is the passage on which the copulative and existential readings diverge, 1017a22-4:

> καθ' αὑτὰ δὲ εἶναι λέγεται ὅσαπερ σημαίνει τὰ σχήματα τῆς κατηγορίας· ὁσαχῶς γὰρ λέγεται, τοσαυταχῶς τὸ εἶναι σημαίνει.
>
> The kinds of essential being are precisely those that are indicated by the figure of predication; for the senses of 'being' are just as many as these figures.

Alexander of Aphrodisias is the first to put forward the line of interpretation according to which in *Met* V 7 Aristotle analyses the different meaning of the verb 'to be' in its copulative use. Alexander takes the expression τὰ σχήματα τῆς κατηγορίας to refer to the ten classes of entities described in *Cat* 4, 1b25-2a4.[135] For Alexander the copula has different meanings in relation to each of the things it is connected with; it signifies the belonging of a subject to category, and the belonging is qualified by the type of category the subject belongs to, hence the copula has a different meaning for each category.[136] When the copula expresses the essential

---

[135] *In Met* 371, 18-20: φησὶ δὲ τοσαυταχῶς τὸ καθ' αὑτὸ ὂν λέγεσθαι ὅσα σχήματα καὶ γένη κατηγοριῶν. σχήματα δὲ κατηγοριῶν τὰς δέκα κατηγορίας λέγει· δεκαχῶς οὖν φησι τὸ καθ' αὑτὸ ὂν λέγεσθαι.

[136] *In Met* 371, 21-2: ἐπεὶ γὰρ ἑκάστῳ τῶν ὄντων τὸ εἶναι συντασσόμενον ταὐτὸν ᾧ συντάσσεται σημαίνει· τὴν γὰρ οἰκείαν ὕπαρξιν ἑκάστου σημαίνει τὸ ὂν ὁμώνυμον.

belonging of a subject to a category, the resulting predicate is a predicate *per se* of the subject.[137]

There are however two interpretative difficulties that remain unresolved on the line of interpretation of the classification of meanings of the verb 'to be' in its copulative use. The first one is that in *Met* V 7 the copulative 'is' is qualified as *per se* (καθ' αὐτὸ), but the examples regard the belonging of an accident to a substance. The second one emerges from the comparison with *De Int* 3, 16b24-5, where Aristotle claims that the copula signifies only a sort of conjunction, and therefore taken by itself does not mean anything (nor, *a fortiori*, can have different meanings):[138]

> οὐ γὰρ τὸ εἶναι ἢ μὴ εἶναι σημεῖόν ἐστι τοῦ πράγματος, οὐδ' ἐὰν τὸ ὂν εἴπῃς ψιλόν. αὐτὸ μὲν γὰρ οὐδέν ἐστιν, προσσημαίνει δὲ σύνθεσίν τινα, ἣν ἄνευ τῶν συγκειμένων οὐκ ἔστι νοῆσαι.
>
> For neither are 'to be' and 'not to be' the participle 'being' significant of any fact, unless something is added; for they do not themselves indicate anything, but imply a copulation, of which we cannot form a conception apart from the things coupled.

The difficulties I have just mentioned have been acknowledged by the supporters of the copulative line of interpretation, and attempts have been made to offer solutions that would make all the textual evidence square well with the general interpretation suggested. Alexander of Aphrodisias is the first to address the problematic comparison between *Met* V 7 and *De Int* 3. Alexander refers to the *De Int* 3 passage quoted above precisely to give support to his own interpretation that the copula may have various meanings for it acquires meaning from the conjunction with something else.[139] Alexander takes Aristotle's point in *De Int* 3 to be that it is impossible to conceive of the copula if not in composition (σύνθεσίν) with (literally)

---

[137] This step in Alexander's reasoning finds support in *Top* I 9, where Aristotle says that a given shade of white, one may say that it is a colour, or at least a white of certain kind: in this way one expresses the 'what it is' of that nuance and signifies a quality.

[138] The same point, based on the comparison with *De Int*, is made also by Leszl (1970: 297).

[139] *In Met* 371, 34-6: ὡς γὰρ εἶπεν ἐν τῷ Περὶ ἑρμηνείας, αὐτὸ μὲν οὐδέν ἐστι, προσσημαίνει δὲ σύνθεσίν τινα, ἣν ἄνευ τῶν συγκειμένων οὐχ οἷόν τε εἶναι.

'what is put together' (τῶν συγκειμένων). For Alexander 'what is put together' are the copula and the complementary part of the predicate. E.g. 'is walking' is a predicate which is composed by the conjunction of the copula with an item from the category of action. But this way of reading the passage is not natural; the natural reading, which all the other interpreters have preferred, is to take 'what is put together' to be the subject and the predicate, which are connected by the copula, e.g. Socrates and his walking.

With respect to the other difficulty for the supporters of the copulative line of interpretation of *Met* V 7, concerning the meaning of the locution *per se* (καθ' αὐτὸ) at 1017a22-30, various suggestions come from the modern interpreters. Ross for example (1924: I 306-7) shares the same general interpretation of the chapter as Alexander, but focuses much more on what distinguishes 'being *per accidens*' from 'being *per se*'. Ross takes 'being *per accidens*' to be that use of the copula we find in sentences of the type 'A man is musical' (this is the example that Aristotle gives at 1017a9 and 1017a14), where the copula relates the subject and the predicate in a purely contingent way. Ross also assumes that Aristotle intends to contrast 'being *per accidens*' with 'being *per se*'; this assumption is well grounded in the text, because of the occurrence of the particles μὲν...δὲ at 1017a7. Ross therefore concludes that 'being *per se*', by contrast with 'being *per accidens*', is that use of the copula by means of which subject and predicate are related by necessity. In fact there are four possible types of propositions with a copulative structure in which subject and predicate are related by necessity: (i) Y is X's definition; (ii) Y is X's genus; (iii) Y is a *differentia* of X; (iv) Y is a property of X. Furthermore, Aristotle, in characterising what it is to be *per se*, adds the claim at 1017a22-3 that the various meanings of the verb 'to be' in its copulative use are to be classified according to kinds that correspond to the categories. Ross understands this claim as a qualification that restricts which uses of the copula count as *per se*.[140] For Ross the connection between subject and predicate expressed by the copula qualifies as *per se* only if it is an intra-categorial relation, i.e. a relation between items belonging to the same category. Ross remarks that of the four types of proposition which express a

[140] By contrast Maier (1969: 328) holds that Aristotle intends all the meanings of the verb 'to be' introduced in the chapter, and not only those of 'being *per se*' to be grouped according to τὰ σχήματα τῆς κατηγορίας. For Meier it is only because of Aristotle's careless exposition that the interpreters are misled on this point.

necessary connection between the subject and the predicate, the ones in which the predicate is a property, a differentia or a definition of the subject, allow that subject and predicate belong to different categories. Therefore the only type of proposition in which the subject and the predicate belong to the same category is the one in which the predicate expresses the subject's genus. This is the only case of predication *per se*.[141] Ross finds the examples offered by Aristotle for this point do not fit with his own interpretation, but he takes this as a matter of obscurity on Aristotle's part. This is however a significant difficulty with Ross' interpretation. For, Ross' interpretation that the only case of predication *per se* is the case in which the predicate expresses the subject's genus, makes it incoherent for Aristotle to claim in the context of *per se* predication that propositions of the form 'Socrates walks' can be converted into propositions of the form '*x* is walking'. For this conversion cannot not apply to propositions in which the predicate expresses the subject's genus. In *Met* V 7, 1017a27-30, Aristotle says:[142]

> οὐθὲν γὰρ διαφέρει τὸ ἄνθρωπος ὑγιαίνων ἐστὶν ἢ τὸ ἄνθρωπος ὑγιαίνει, οὐδὲ τὸ ἄνθρωπος βαδίζων ἐστὶν ἢ τέμνων τοῦ ἄνθρωπος βαδίζει ἢ τέμνει, ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων.
>
> For, there is no difference between 'the man is recovering' and 'the man recovers', nor between 'the man is walking or cutting' and 'the man walks' or 'cuts'; and similarly in all other cases.

---

[141] Ross' conclusion is shared also by Apelt (1975: 123).

[142] Aristotle makes the same point also in *De Int* 10, 20a3-15, and in *An Pr* I 46, 51b5-16. *De Int* 10, 20a3-15: 'When the verb 'is' does not fit the structure of the sentence (for instance, when the verbs 'walks', 'enjoys health' are used), that scheme applies, which applied when the word 'is' was added'. 12, 21b5-10: 'Now if this is the case, in those propositions which do not contain the verb 'to be' the verb which takes its place will exercise the same function. Thus the contradictory of 'man walks' is 'man does not walk', not 'not-man walks'; for to say 'man walks' merely equivalent to saying 'man is walking''. *Pr An* I 46, 51b5-16: 'In establishing or refuting, it makes some difference whether we suppose the expression 'not to be this' and 'to be not-this are identical or different in meaning, e.g. 'not to be white' and 'to be not-white'. For they do not mean the same thing, nor is 'to be not-white' the negation of 'to be white', but rather 'not to be white'. The reason for this is as follows. The relation of 'he can walk' to 'he can not-walk' is similar to the relation of 'it is white' to 'it is not-white'; so is that of 'he knows what is good' to 'he knows what is not-good'. For there is no difference between the expressions 'he knows what is good' and 'he is knowing what is good', or 'he can walk' and 'he is able to walk': therefore there is no difference between their opposites 'he cannot walk' – 'he is not able to walk'.

Another suggestion to solve the interpretative problem of how to account for the belonging *per se* of an accident to a substance has been offered by Kahn. He takes propositions of the type '*x* is accidentally *F*' to express un-natural predications, so called because the logical subject does not coincide with the grammatical one (e.g. 'The musical is man'), by contrast with propositions of the form '*x* is *per se* F' that express natural predications.[143] This criterion for differentiating 'being *per se*' from 'being *per accidens*' however still incurs into the difficulty of explaining one of the examples given by Aristotle. For, one of the examples of 'being *per accidens*' that Aristotle proposes is 'The man is musical' (repeated twice, at 1017a9 and 1017a14-5) which clearly expresses a natural predication.

In conclusion, the line of interpretation according to which in *Met* V 7 Aristotle introduces different meanings of the verb 'to be' in its copulative use leaves unresolved a few difficulties that the commentators have not yet satisfactorily addressed.

I will now turn to the other traditional line of interpretation, the one according to which Aristotle introduces different meanings of the verb 'to be' in its existential, rather than copulative, use. The general idea of this line of interpretation is that given any item Y falling under a certain category, 'to be', i.e. 'to exist', means for it to be in a certain relation with an item X falling under the category of substance. This interpretation is held for instance by Kirwan.[144] Kirwan's interpretation in terms of criteria of existence is clearly very different from Ross' one. For, Ross concludes his interpretation of *Met* V 7 by assimilating the various meanings of to be that Aristotle gives to various types of judgements. He writes (1924: I 309):

> 'While the first three senses seem to answer to three types of judgement, (1) A is (accidentally) B, (2) A is (essentially) B, (3) A *is* B (= is true that A is B), the fourth answers not to a type of statement co-ordinate with these, but to two senses [namely, being in potentiality and being in actuality] in which each of them may be taken'.

---

[143] This terminology has been introduced by Barnes (1975: 112).

[144] Kirwan also remarks that the various meanings of the verb 'to be' clearly exceed the number of the figures of predication, which Aristotle takes to be eight (or in some contexts ten; e.g. *Met* III 2, 1003b6-10, *De Anima* II 4, 415b13). Hence, Kirwan takes Aristotle's statement that the meanings of 'being *per se*' are as many as to τὰ σχήματα τῆς κατηγορίας to mean that the various meanings may be classified and ordered in categories, rather than to mean that they may be exhaustively listed as the figures of predication.

There are however difficulties that the existential line of interpretation creates, and that rather support the copulative interpretation. For instance Thorp (1974: 238-56) remarks that all the occurrences of the expression *per se* in the chapter are of the type '*x* is *per se F*', in which the verb to be is clearly used as copula.

## 2. Ways of being

The difficulties that the two traditional lines of interpretation leave unresolved show that there is room for attempting a new interpretation of the chapter. I suggest reading the chapter as a classification of different types of entities. The opening lines of the chapter, 1017a7-8, read as follows:

Τὸ ὂν λέγεται τὸ μὲν κατὰ συμβεβηκὸς τὸ δὲ καθ' αὑτό

Comparing these lines with two of the most thematically relevant passages, *Met* IV 2 and VII 1,[145] makes clear that in *Met* V 7, by contrast with the other two cases, Aristotle uses the nominalized participle precisely to indicate that he is giving a classification of entities. I contrast this interpretation to the ones according to which it is classification of existential or copulative uses of the verb to be. Indeed, elsewhere in *Met* VIII 2, 1042b25-31, where Aristotle clearly focuses on a classification of the uses of the verb 'to be' in its existential meaning, he uses the nominalized present tense, τὸ ἔστι, rather than the participle.[146] In addition to these considerations on the linguistic level, the interpretation that in *Met* V 7 Aristotle introduces different entities rather than different uses of the verb 'to be' finds further

[145] *Met* IV 2, 1003b5-10: 'So, too, there are many senses in which a thing is said to be, but all refer to one starting-point; some things are said to be because they are substances, others because they are affections of substance, others because they are a process towards substance, or destructions or privations or qualities of substance, or productive or generative of substance, or of things which are relative to substance, or negations of one of these thing of substance itself. It is for this reason that we say even of non-being that it is non-being'.
*Met* VII 1, 1028a1-20: 'There are several senses in which a thing may be said to 'be', as we pointed out previously in our book on the various senses of words;' for in one sense the 'being' meant is 'what a thing is' or a 'this', and in another sense it means a quality or quantity or one of the other things that are predicated as these are. While 'being' has all these senses, obviously that which 'is' primarily is the 'what', which indicates the substance of the thing. For when we say of what quality a thing is, we say that it is good or bad, not that it is three cubits long or that it is a man; but when we say what it is, we do not say 'white' or 'hot' or 'three cubits long', but 'a man' or 'a 'god'. And all other things are said to be because they are, some of them, quantities of that which is in this primary sense, others qualities of it, others affections of it, and others some other determination of it.'

[146] Dubois (1998: 67) raises the question of why Aristotle chooses the participle rather than any other verbal form: 'Avant d'entreprendre le commentaire de ce chapitre consacré à l'*étant* (*on*), on est en droit de se demander pourquoi Aristote explique précisament ce mot plutôt que le verbe *einai* et surtout que le présent *esti* qui était le point de départ de la réflexion de Parménide. Ce n'est pas ici le lieu de répondre à cette question puisque Aristote lui-même ne la pose pas. Il importe toutefois de la garder présente à l'esprit, sourtout lorsque, dans son commentaire, Aristote est obligé de se référer à la signification du verbe *esti* dans l'analyse de l'attribution'.

support in the following consideration. While the expression '*per se*' may be applied to items belonging to categories other than the category of substance, there is no sense of the expression '*per se*' which could be applied to the verb 'to be' neither in its copulative nor its existential use for anything else but substances. In fact the expression *per se* qualifies the verb 'to be' in its existential use only in the following way: X is *per se* if X is not said of anything else as its subject. This is the third meaning of the expression *per se* which Aristotle lists in *An Post* I 4, 73b5-10. But only substances exist *per se* in this sense, not items belonging to other categories. However, in *Met* V 7 being *per se* is claimed to be said in as many ways as the number of the categories. So any meaning we attribute to the expression *per se* in *Met* V 7 must be appropriate also for non substantial items. I suggest interpreting *per se* along the following lines: *x* is *per se* if it is the type of entity it is without there being composition at a more primitive level between different types of entities that make up what *x* is. (For example, contrast an accident with an accidental composite: the accident is *per se*, the accidental composite is not). On this understanding of what *per se* means, an item belonging to any category, other than the category of substance, may be said to be *per se*. For what does not belong to the category of substance is *per se* a certain type of item, although it does not exist *per se*. Those items which do not fall under the category of substance exist in virtue of their belonging to substances, namely in virtue of a predicative relation between themselves and the substance which is their subject.[147] Non-substantial items cannot therefore be said to exist *per se*, because they are dependent entities, but they can be correctly be said to be *per se*, if their definition does not contain reference to a predicative relations between ontologically more primitive items.[148] Only substances are *per se* with respect both to definition and to existence. Everything else that does not fall under the category of substance may be said *per se* only with respect to definition.[149] Further evidence for this point is to be found in *Met* VII 4, where

---

[147] See e.g. *Met* VII 1, 1028a18-20.

[148] Scaltsas (1994: 169) explains in which sense non-substances can have in a derivative sense definition, essence, and 'what it is' in the light of what Aristotle says in *Met* VII 4 and 6, and taking into consideration also *Met* V 18. For Scaltsas non-substances are definable only derivatively; for, in order to ask the question 'what is it' about a non-substantial item one has to perform what Scaltsas calls a subject shift. Namely one has to consider the non-substance in abstraction, as if it were a subject *per se*.

[149] Commentators have registered the difficulty of explaining how items that are not substances may be said to be *per se*, and how what Aristotle claims in *Met* V 7 is compatible with what he says in *Met* VII

Aristotle claims that to exist and to have a definition are primarily and absolutely speaking (πρώτως, ἁπλῶς) features of the substance and only in a derivative sense (ἑπομένως, πὼς) also of the items that do not fall under the category of substance.[150]

In the light of the remarks made so far, let us return to the following passage from *Met* V 7, 1017a22-7:

> καθ' αὑτὰ δὲ εἶναι λέγεται ὅσαπερ σημαίνει τὰ σχήματα τῆς κατηγορίας· ὁσαχῶς γὰρ λέγεται, τοσαυταχῶς τὸ εἶναι σημαίνει. ἐπεὶ οὖν τῶν κατηγορουμένων τὰ μὲν τί ἐστι σημαίνει, τὰ δὲ ποιόν, τὰ δὲ ποσόν, τὰ δὲ πρός τι, τὰ δὲ ποιεῖν ἢ πάσχειν, τὰ δὲ πού, τὰ δὲ ποτέ, ἑκάστῳ τούτων τὸ εἶναι ταὐτὸ σημαίνει
>
> The kinds of essential being are precisely those that are indicated by the figures of predication; for the senses of 'being' are just as many as these figures. Since, then, some predicates indicate what the subject is, others its quality, others quantity, others relation, others activity or passivity, others its 'where', others its 'when', 'being' has a meaning answering to each of these.

The distinction between the two senses in which something may be said to be *per se*, namely with respect to definition and to existence, has broader interpretative consequences. For, it allows us to recognise the passage above as a specific stage in the development of Aristotle's theory of definition, in between the *Topics* and *Met* VII-VIII. The *Topics* model of definition, which is by genus and differentia, does not contain any reference to the question whether the *definiendum* belongs or not to a substratum. This is why on this model there is no difference between the definitions

---

1. Paul of Venice, for example, among the medieval commentators, writes: 'Dubitatur quia ens divisum in decem predicamenta est ens secundum se per Philosophum in littera, sed omne divisum per se predicatur de quolibet suorum dividentium; ergo omne predicamentum est ens per se, consequens est falsum, quia accidentia non sunt entia per se, sed in alio. Accidens enim non est ens nisi quia entis, et accidentis esse est inesse, per Philosophum, septimo huius. Respondetur quod omne accidens, tam concretum quam abstractum, est ens per se, ut musicum et musica, calidum et caliditas, ex quo ista sunt per se in predicamento et formaliter continentur sub ente. Composita enim per aggregationem substantie et accidentis extra se invicem sunt entia per accidens, ut homo albus, sed simplicia sunt entia per se'. Paul of Venice *In Met*, f. 68vb**M**.

[150] *Met* VII 4, 1030a21-7: 'For as 'is' belongs to all things, not however in the same sense, but to one sort of thing primarily and to others in a secondary way, so too 'what a thing is' belongs in the simple sense to substance, but in a limited sense to the other categories. For even of a quality we might ask what it is, so that quality also is a 'what a thing is',-not in the simple sense, however, but just as, in the case of that which is not, some say, emphasizing the linguistic form, that that is which is not is-not is simply, but is non-existent; so too with quality'.

of a substance (which does not belong to any substratum) and of any non-substantial item (which necessarily belongs to a substratum). By contrast, in the *Met* VII-VIII model of definition, the definition must mention the conditions for existence of the *definiendum*. These conditions are clearly different for substances and for non-substantial entities. In particular, in the case of a non-substantial item *x* its definition must mention, among the conditions for its existence, also the belonging of *x* to a substance, and the substance itself to which *x* belongs. How does Aristotle move from one model for definition to the other? In an ideal reconstruction of the development of Aristotle's theory of definition, which I sketch here only very roughly, we may then distinguish three stages. The first one corresponds to Aristotle's position in the *Topics*; the second to his position in the *Posterior Analytics*; the third to his position in the central books of the *Metaphysics*. In order to highlight the difference between the *Topics* and the *Analytics* models for definition, let us first consider the case of non-substantial items. On the *Topics* model, we can give a 'nominal' definition of a non-substantial item which expresses what the thing is, regardless of whether it actually exists or not, and hence whether it is instantiated in a substance or not. For example, the definition of white on the *Topics* model is: a colour of a certain type. This definition contains no reference to the fact that white, being a quality, needs a substratum to which to belong – which is the surface of objects. By contrast, as we see e.g. in *Post An* II 10, the 'real' (as opposed to 'nominal') definition of something presupposes that the *definiendum* exists, hence it cannot ignore what the conditions for its existence are. The 'real' definition captures the condition for the existence of the *definiendum* by expressing the causes of the *definiendum*, including the material cause. To return to the previous example, the definition of white on the *Analytics* model is: surface coloured in a certain way. The *Analytics* model can in fact be read as an attempt to achieve equivalence between nominal and real definition of something. This equivalence is however reached only in the third stage of development of Aristotle's theory of definition, in the central books of the *Metaphysics*, where Aristotle's understanding of the genus as matter allows him to make definition and conditions for existence of something fully equivalent.[151] In *Met* V 7 non-substantial items are said to be *per se* on the ground

[151] On Aristotle's theory of definition in the central books of the *Metaphysics*, see e.g. Bostock (1994: 279-290).

that their being what they are does not rest on a dependence relation between more primitive constituents. In this respect, the position Aristotle takes in *Met* V 7 reflects an intermediate stage in between the *Topics* and the central books of the *Metaphysics*. Aristotle shows awareness that the conditions for existence of the *definiendum* play a role, although they do not (yet) have in his account the same centrality as in the central books of the *Metaphysics*.

In conclusion, the interpretative suggestions I put forward in relation to *Met* V 7 are the following. In the chapter Aristotle presents a classification of entities, rather than of meanings of the verb 'to be' in either its copulative or existential use. These entities are said by Aristotle to be *per se*. I suggest understanding this claim by distinguishing two senses in which something can be said to be *per se*. One sense in which something can be said to be *per se* is with respect to its existence, i.e. it does not depend on something else to exist. Another sense is with respect to its definition, i.e. its definition does not require reference to other more primitive entities related as to create its internal structure. Only substances are *per se* in both senses; non-substances are *per se* only in the latter sense. The entities that Aristotle introduces in *Met* V 7 are non-substantial, hence they are *per se* only in definition; they do not exist *per se*. Those entities are accidents, whose actual existence is parasitic, we may say, on substances: they necessarily belong to a subject. Finally, reading *Met* V 7 as a classification of entities allows a better interpretation of Aristotle's claim at 1017a27-30 that any proposition of the type e.g. '*x* walks' is reducible to a proposition with a copulative structure of the type '*x* is walking'. For, the conversion into a copulative structure highlights what we may call the nominal aspect of the verb, along the lines of what Aristotle says in *De Int* 3.[152] In the *De Interpretatione* Aristotle reckons two functions peculiar to verbs that distinguish them from nouns: expressing the way things are related, and locating this relation in time.[153] In a proposition with

---

[152] *De Int* 3, 16b19-20: αὐτὰ μὲν οὖν καθ' αὑτὰ λεγόμενα τὰ ῥήματα ὀνόματά ἐστι καὶ σημαίνει τι. 'Verbs in and by themselves are substantival and have significance'.

[153] *De Int* 3, 16b23-5: αὐτὸ μὲν γὰρ οὐδέν ἐστιν, προσσημαίνει δὲ σύνθεσίν τινα, ἣν ἄνευ τῶν συγκειμένων οὐκ ἔστι νοῆσαι. 'They do not themselves indicate anything, but imply a copulation, of which we cannot form a conception apart from the things coupled'. Also, 16b6: Ῥῆμα δέ ἐστι τὸ προσσημαῖνον χρόνον. 'A verb is that which, in addition to its proper meaning, carries with it the notion of time'. And, 10, 19b14: ῥήματα ἐκ τῶν κειμένων ἐστίν· προσσημαίνει γὰρ χρόνον. 'The expressions 'is', 'will be', 'was', 'is coming to be', and the like are verbs according to our definition, since besides their specific meaning they convey the notion of time'.

copulative structure, the two functions are both transferred to the copula, and the predicative complement of the copula may be understood as the name of an entity.[154]

[154] On this point, see Leszl (1970: 36-9).

### 3. The multiplicity of the meanings of 'to be' in Aristotle's works

There is a close parallelism between the classification of the various meanings of τὸ ὄν in *Met* V 7 and in VI 2, 1026a33-b2. Interpreters agree in thinking that in *Met* VI 2, 1026a34, there is a clear reference to V 7. Here is the text that I am going to examine:

> Ἀλλ' ἐπεὶ τὸ ὂν τὸ ἁπλῶς λεγόμενον λέγεται πολλαχῶς, ὧν ἓν μὲν ἦν τὸ κατὰ συμβεβηκός, ἕτερον δὲ τὸ ὡς ἀληθές, καὶ τὸ μὴ ὂν ὡς τὸ ψεῦδος, παρὰ ταῦτα δ' ἐστὶ τὰ σχήματα τῆς κατηγορίας οἷον τὸ μὲν τί, τὸ δὲ ποιόν, τὸ δὲ ποσόν, τὸ δὲ πού, τὸ δὲ ποτέ, καὶ εἴ τι ἄλλο σημαίνει τὸν τρόπον τοῦτον), ἔτι παρὰ ταῦτα πάντα τὸ δυνάμει καὶ ἐνεργείᾳ
>
> But since the unqualified term 'being' has several meanings, of which one was seen to be[155] the accidental, and another the true ('non-being' being the false), while besides these there are the figures of predication (e.g. the 'what', quality, quantity, place, time, and any similar meanings which 'being' may have), and again besides all these there is that which 'is' potentially or actually.

The same expression τὸ ὄν occurs in both passages in *Met* V 7 and VI 2, but in VI 2 Aristotle qualifies it as τὸ ἁπλῶς λεγόμενον. Interpreters have noted this variation, and have explained it in different ways. Some commentators take τὸ ἁπλῶς λεγόμενον to indicate the level of generality at which Aristotle is making his statement. This is how Aquinas understands it for instance; he reads ἁπλῶς translated as *simpliciter*, and paraphrases it as *idest universaliter dictum.*[156] Other modern commentators, for example Kirwan, take ἁπλῶς to mean 'unqualified'; Kirwan translates it 'when baldly so called' (1971: 68). The fact however that the qualification τὸ ἁπλῶς λεγόμενον does not appear in other passages where Aristotle distinguishes various meanings of τὸ ὄν (e.g. *Met* III 1 and 2, VII 1) suggests in my view that the use of this qualification is more significant to the interpretation of *Met*

[155] The use of past tense suggests that there has been a previous discussion of the issue, and the interpreters agree in reckoning it in *Met* V 7.

[156] *In Met* lib VI lec 2 [1171]. My hypothesis is that Aquinas paraphrases *simpliciter* with *universaliter dictum* to avoid possible misunderstandings that might arise because the expression *esse simpliciter* describes a way of being proper to God.

VI 2 than the commentators take it to be. In support of this suggestion, I will first examine whether *Met* VI 2 offers a classification of various meanings of the verb 'to be' in its existential use, or rather a classification of entities analogous to the one in *Met* V 7. The former interpretation has been put forward for instance by Kirwan.

Kirwan reckons two main uses of the adverb ἁπλῶς in Aristotle's works, one to signify 'without qualification' (e.g. in *Met* VI 2, 1027a5), and the other 'without addition' (e.g. *Top* II 2, 115b29-35). He holds that ἁπλῶς in the second sense is used by Aristotle to qualify the verb 'to be' in its existential use (and to distinguish it from the copulative use), and finds evidence for this claim e.g. in *Post An* II 1, 89b33.[157] Kirwan wants to extend this interpretation also to *Met* VI 2, 1026a33, which he sees as a classification of meanings of the verb 'to be' in its existential use. Kirwan's interpretation, however, encounters two possible objections, of which he himself is aware. The first is that in *Met* VII 1, 1028a30-1, Aristotle says that only substances can be ἁπλῶς. In response, Kirwan merely notes that Aristotle's assertion in *Met* VII appears to be contradicted in VI 2, and does not enter into an exegetical discussion of this discrepancy between the two texts. His suggestion is that 'Aristotle had no settled opinion as to whether '*x* is' must be elliptical when *x* is a non-substance'. The second difficulty is that being true, which is one of the meanings of 'to be' Aristotle mentions in *Met* VI 2, is not a type of existence. Kirwan finds a solution to this difficulty in *Met* V 29 where 'Aristotle treats falsehood as a property not of propositions or sentences, but of "actual things", *sc.* states of affairs, and infers that a false state of affairs is one that 'is not'. This doctrine does in effect propose that truth and falsehood are forms of existence and non-existence'. Kirwan's conclusion is that 'even if there are places in which Aristotle restricts "being baldly" to substances, he does not do so in VI 2; and that in VI 2 "is baldly" means "exists"'. But Kirwan (1971: 189-90) only asserts his conclusion, and does not offer sufficient argumentative support for it.

The alternative interpretation I want to suggest is grounded in a different understanding from Kirwan's of the main uses of the adverb ἁπλῶς in connection

[157] *Contra* Kirwan, Kahn (1966: 263-4) writes: 'One may, if one chooses, explicate εἶναι τι by reference to the copula; but εἶναι ἁπλῶς is not in general "to exist". On the contrary, it is a either an indeterminate expression, since for Aristotle there is no one, single meaning of "to be", or else it refers specifically to the being of substances, as the primary instance of being in general'.

with the verb 'to be'. On the basis of an analysis of the most relevant passages,[158] I suggest the adverb ἁπλῶς is used by Aristotle to differentiate the way of existing of substances, which are what everything else is predicated of but not predicated themselves of anything else, from the way of existing of non-substances, whose existence in actuality depends on their belonging to an actual substance.[159] The first use of ἁπλῶς is to be found e.g. in *Met* VII 1, 1028a30-1, and 4, 1030a21-7:

> ὥστε τὸ πρώτως ὂν καὶ οὐ τὶ ὂν ἀλλ' ὂν ἁπλῶς ἡ οὐσία ἂν εἴη.
>
> Therefore that which is primarily, i.e. not in a qualified sense but without qualification, must be substance.

> ὥσπερ γὰρ καὶ τὸ ἔστιν ὑπάρχει πᾶσιν, ἀλλ' οὐχ ὁμοίως ἀλλὰ τῷ μὲν πρώτως τοῖς δ' ἐπομένως, οὕτω καὶ τὸ τί ἐστιν ἁπλῶς μὲν τῇ οὐσίᾳ πὼς δὲ τοῖς ἄλλοις· καὶ γὰρ τὸ ποιὸν ἐροίμεθ' ἂν τί ἐστιν, ὥστε καὶ τὸ ποιὸν τῶν τί ἐστιν, ἀλλ' οὐχ ἁπλῶς, ἀλλ' ὥσπερ ἐπὶ τοῦ μὴ ὄντος λογικῶς φασί τινες εἶναι τὸ μὴ ὄν, οὐχ ἁπλῶς ἀλλὰ μὴ ὄν, οὕτω καὶ τὸ ποιόν.
>
> 'What a thing is' in one sense means substance and the 'this', in another one or other of the predicates, quantity, quality, and the like. For as 'is' belongs to all things, not however in the same sense, but to one sort of thing primarily and to others in a secondary way, so too 'what a thing is' belongs in the simple sense to substance, but in a limited sense to the other categories. For even of a quality we might ask what it is, so that quality also is a 'what a thing is',-not in the simple sense, however, but just as, in the case of that which is not, some say, emphasizing the linguistic form, that that is which is not is-not is simply, but is non-existent; so too with quality.

In order to shed light on the second use of ἁπλῶς, in relation to non substantial items, let us begin with the working hypothesis that *x* is ἁπλῶς if *x* is "in virtue of being something" (ὄν τι), and is not ἁπλῶς if it is not "in virtue of being something" (μὴ ὄν τι). Two passages are particularly relevant to clarify this hypothesis. The first one is *Phys* I 3, 187a3-6:

---

[158] For a complete list of the occurrences of the adverb ἁπλῶς see Bonitz, *Index*, 76a-77b.
[159] See the discussion of this topic in chapter 1.

φανερὸν δὲ καὶ ὅτι οὐκ ἀληθὲς ὡς, εἰ ἓν σημαίνει τὸ ὂν καὶ μὴ οἷόν τε ἅμα τὴν ἀντίφασιν, οὐκ ἔσται οὐθὲν μὴ ὄν· οὐθὲν γὰρ κωλύει, μὴ ἁπλῶς εἶναι, ἀλλὰ μὴ ὄν τι εἶναι τὸ μὴ ὄν

But obviously it is not true that if 'to be' means 'to be one', and it is impossibile that two contradictories are true at the same time, that-which-is-not will not be at all. For, nothing prevents that that-which-is-not is not without qualification, but is even if it is not a particular being (my translation).

In the first part of the passage just quoted, 187a3-4, Aristotle is reconstructing the arguments of those who from the premises that (i) 'to be' means 'to be one', and that (ii) it is impossible to be an not to be at the same time in the same respect, conclude that (iii) that-which-is-not is not at all. The conclusion (iii) is derived through an argument *ad absurdum*. Suppose, contrary to (i) that that-which-is-not is (in same way); then there must be a way of being which is appropriate for that-which-is-not and is also different, because of (ii), from the way of being which characterises that-which-is. But if there are these two ways of being, as one seems forced to admit, then 'to be' no longer means 'to be one', contrary to (i). Thus the initial hypothesis *per absurdum* must be abandoned. And it is true that that-which-is-not is not at all. In the second part of the passage quoted above, 187a5-6, Aristotle rejects the argument just presented, claiming that that-which-is-not is not ἁπλῶς, i.e. it is not something (μὴ ὄν τι), but nevertheless it is. The non-being has its own way of being, we might say, although its way of being is not to be something determinate.[160]

This interpretation is derived from the following reading of the text. It is natural to read the expression μὴ ὄν τι as explicative of μὴ ἁπλῶς. The meaning of the expression μὴ ὄν τι depends on how we understand τι, which can be taken either as a predicative complement of 'to be', or as an adverb. In the first case, the expression μὴ ὄν τι could mean either 'without being something' – where τι is a variable, meaning: a type of thing; or else 'without being something determinate' – where τι stands for a new entity that would be in existence if that-which-is-not were

[160] Ross (1924: 481) paraphrases Aristotle thus: 'But it is also evident that it is not true that if being means one thing and cannot at the same time mean the opposite of that thing, no non-being will be; for there is nothing to prevent that which is not – not from being, simply, but from being what is not some particular thing'.

to be. In the second case, if τι is taken as an adverb, the expression μὴ ὄν τι means 'not being, but only in a certain sense'. In order to determine which reading is preferable, there is another significant passage to be taken into account, *Met* VII 1, 1028a30-1, where Aristotle contrasts the expressions οὐ τὶ ὄν (equivalent to μὴ ὄν τι) with ὂν ἁπλῶς. In that context there are reasons (mentioned above p. 114) to prefer reading οὐ τὶ ὄν as meaning 'without being something determinate'. By analogy, it appears preferable to give the same reading as in *Met* VII 1 also in *Phys* I 3. Hence, Aristotle's claim there is that the fact that that-which-is-not is (in some way) does not amount to the coming into being of a new entity with its own determinate nature.

In sum, on the ground of the analysis of the three passages, *Met* V 7 and VI 2, and *Phys* I 3, I suggest to take 'to be ἁπλῶς' to signify not generically existence, but rather the way in which something is in virtue of being something determinate, by contrast with the way in which something is not, being nothing at all.

## 4. Final Remarks

In the course of analysing *Met* V 7 I have often mentioned, at least cursorily, that there is an ongoing debate among modern interpreters regarding whether Aristotle understands the potential ambiguity of the verb 'to be'. As it is clear to us nowadays, the verb 'to be' may be used to signify a copulative relation between two terms (*x* is F, i.e. F is predicated of *x*); a relation of identity between two items (*x* is *y*, i.e. *x* and *y* are identical); and finally simply the existence of something (*x* is, i.e. *x* exists). If these various meanings of the verb 'to be' are not kept distinct, the richness in meaning of the verb becomes *ipso facto* ambiguity. Modern commentators debate whether, and to what extent, Aristotle is aware of such distinction between different uses and meanings of the verb 'to be', and furthermore whether he classifies them according to some order of priority. After two major studies on this topic came out in the mid-Sixties by Owen and Khan[161] the majority of commentators seemed convinced that nowhere in Aristotle do we find an articulate distinction of the various meanings of 'to be'. More recently Hintikka has deemed this distinction of meanings 'completely anachronistic when applied to Aristotle'.[162] And yet, there are some

---

[161] Owen (1965: 71) finds in Plato's *Sophist* a first attempt, which he thinks Aristotle carries forward, to distinguish among dyadic uses of the verb 'to be' the cases in which the verb has the function of the copula and the cases in which it has the function of a sign of identity: 'He [i.e. Plato] treats 'to be' and 'not to be' alike incomplete or elliptical expressions which always call for some completion: *to be* is just *to be something or other*. And if this is so his analysis becomes the direct parent of Aristotle's...It is evidently a similar broad division in the uses of that verb that Aristotle is drawing in such passages as the seventh chapter of *Metaphysics* V where he marks off *to kath'hauto on* ...from, among other things, *to kata sumbebêkos on*...But the same chapter shows that it is not these broad distinctions that he has in mind in the text from which we set out. For he offers to take only one such general function of the verb and show that it harbours a certain multiplicity of use; and he identifies this multiplicity by saying that 'being' has *different uses in different categories* (1017a22-30) ...So the argument in our text is confined to one general function of the verb; and it squares with the view that it is concerned with question of existence' (italics in the original). Also, Kahn (1966: 247) highlights the reasons why he doubts that in ancient Greek it is genuinely possible to distinguish different uses of the verb 'to be' as copulative, existential and identity: 'This fusion of a syntactic and a semantic criterion into a single antithesis [between copulative and existential use] could be justified only if there were a direct correlation between the two, i.e. only if (1) the absolute use of the verb is always existential in meaning, (2) the verb 'to be' in the predicative construction is always devoid of meaning, serving as merely formal or grammatical device for linking the predicate with the subject. But these assumptions seem to me false...for Greek'.

[162] Hintikka (1986: 82-83): 'Not only does he [Aristotle] refuse to countenance the Frege-Russell distinction as homonymy between several different *meanings*. He does not always recognize the distinction as a separation between different *uses* of the Greek words for being (italics in the original). For the same point, see also Hintikka (1983: 443-468).

contemporary and authoritative commentators who attempt to establish which of these uses we might consider in fact the primary one for Aristotle. The debate is between those interpreters who hold that the fundamental use is the existential one, and those who think it is the copulative one. The former position has been supported most significantly by Owen (1965: 82) and Matthen (1983: 124-5), while the latter has been supported by Kahn (see below).

Matthen expresses his interpretation as a rhetorical question which presupposes a positive answer:

> 'Could Aristotle not be assuming...that all uses of 'is' correspond to a monadic use, and in particular that the copula can be made monadic by moving its complement to attributive position?'

Matthen explains how the copulative use is reducible to the existential one by introducing the notion of a *predicative complex*, which he defines as the

> 'entity formed, as Aristotle suggests in *Met.* VII 12, from a universal and a particular when that particular instantiates that universal...A predicate complex is therefore the *denotatum* of a part of a sentence, and does not correspond to a sentence as a whole...A complete thought is formed by attributing (monadic) being or non-being to one of these complexes'.

By contrast, for Kahn (1986: 3) 'the copula [is] the centre of the system of uses of εἶναι'. Kahn explains that the copulative use is more fundamental than the existential one because of its statistic predominance, its being syntactically more elementary, and its conceptual priority. For Khan the copulative use of 'to be' is to be understood as the focal meaning of the verb, from which all the others depend. Kahn's proposal culminates in a reinterpretation of the Aristotelian notion of τὸ τί ἦν εἶναι in the light of the supposed priority of the copulative use of the verb 'to be' over the existential one, thus:

> The general tendency of this Aristotelian method in ontology is for the existential idea to be absorbed into the theory of predication, and to be expressed linguistically by copula uses of the verb. So we find that the key ontological formula of Aristotle's metaphysics, the τὸ τί ἦν εἶναι, defines the

mode of existence for any subject whatsoever, but it does so without any existential use of the verb (1971: 332).

*Met* V 7, along with VIII 2, is considered by both groups of commentators to be one of the texts most relevant to the debate on the ambiguity of the verb 'to be'. By contrast with the traditional view, in the interpretation I suggest the theme of *Met* V 7 is not the classification of existential or copulative uses of the verb 'to be', but rather of entities. This is why in my view this chapter is not textual evidence to the debate.

# Chapter 4: The Analysis of the Puzzle (III): Sameness and Difference

## 1. Accidental identity

*Met* V 9 has two parts: the first, 1017b27-1018a13, regards sameness and difference, the second, 1018a13-9, regards similarity and dissimilarity, articulated in the following subsections:

Part I

i) 1017b27-1018a4, on identity *per accidens*

ii) 1018a4-9, on identity *per se*

iii) 1018a9-11, on otherness

iv) 1018a11-5, on difference

Part II

v) 1018a15-8, on similarity

vi) 1018a18-9, on dissimilarity

Regarding the first section of the first part of the chapter, there is an apparent correspondence between the three kinds of accidental identity described in *Met* V 9, 1017b27-1018a4, and the three kinds of accidental unity described in *Met* V 6, 1015b16-36 in so far as they are relations holding between the same pairs of *relata*: 1) two accidents predicated of the same substance; 2) a substance and the accident that is predicated of it; 3) an accidental composite and each of its constituents. The same examples also occur in the two chapters 6 and 9. In *Met* V 9 Aristotle adds a parenthetical section, 1017b33-1018a4, formulated as a syllogism, to the effect of arguing that accidental identities cannot be generalised, because universal propositions are essential.[163] This remark follows, as Bonitz (*In Met* 245) and Kirwan (1971: 149) note too, from the definition Aristotle gives of universal propositions in *Post An* I, 73b26-8.[164] There Aristotle claims that if a given attribute Y belongs always and to all subjects that fall under the genus X, and has all *x*s as its proper subjects, then the belonging of Y to subjects that fall under X depends on their essence *qua x*s, hence it is *per se*. Hence, it is necessary to make a distinction between the case in which accidents belong to subjects that are universal and the case

[163] On this remark being made in the form of a syllogism see e.g. Alexander of Aphrodisias (*In Met* 377, 6-7) and Ross (1924: 312).

[164] *Post An* I, 73b26-8: καθόλου δὲ λέγω ὃ ἂν κατὰ παντός τε ὑπάρχῃ καὶ καθ' αὑτὸ καὶ ᾗ αὐτό. φανερὸν ἄρα ὅτι ὅσα καθόλου, ἐξ ἀνάγκης ὑπάρχει τοῖς πράγμασιν.

in which accidents belong to particular subjects, as Aristotle mentions at 1017b35-1018a2:

> τὰ γὰρ καθόλου καθ' αὑτὰ ὑπάρχει, τὰ δὲ συμβεβηκότα οὐ καθ' αὑτά· ἀλλ' ἐπὶ τῶν καθ' ἕκαστα ἁπλῶς λέγεται·
>
> For universal attributes belong to things in virtue of their own nature, but accidents do not belong to them in virtue of their own nature); but of the individuals the statements are made without qualification.

Crucial to the understanding of this passage is the meaning of the adverb ἁπλῶς, by means of which Aristotle makes a distinction between universals and particulars that may be read in two ways: as a distinction either between singular and universal terms (e.g. Socrates *versus* Man) or between propositions having as subject singular and universal terms (e.g. 'Socrates and the musical Socrates are coincidentally the same' *versus* 'Every man is coincidentally the same as that which is musical').[165] Bonitz (*In Met* 245) and Kirwan (1971: 150) adopt the first reading; Duminil and Jaulin the second. It is worth noting that Bonitz on the one hand, and Duminil and Jaulin on the other, find ground for their diverging interpretations of the meaning of ἁπλῶς in this context in the comparison with the same passage in *Met* V 5, 1015b7-8.[166] There Aristotle says that a demonstration ἁπλῶς leads to a necessary conclusion such as to express that things are in a certain way and could not be different. If ἁπλῶς has the same meaning in the passage in *Met* V 9, then it signifies that the relation between the accidents and the particular subject is necessary without further qualification. This is the interpretation that Duminil and Jaulin (1991: 194) put forward. By contrast, according to Bonitz' interpretation, which is shared on different grounds also by Kirwan, ἁπλῶς according to the same passage in *Met* V 5 has the function of expressing an opposition between universal and particular terms. Universal terms can be the subject of accidental predications in the sense that the accidents predicated of them betoken some particular of the universal (and this is expressed through some appropriate qualification such as ἄνθρωπός τις), while

[165] Kirwan (1971: 150) mentions both possible readings, and after him so does Duminil (1991: 194).

[166] *Met* V 5, 1015b7-8: ἔτι ἡ ἀπόδειξις τῶν ἀναγκαίων, ὅτι οὐκ ἐνδέχεται ἄλλως ἔχειν, εἰ ἀποδέδεικται ἁπλῶς· 'Again, demonstration is a necessary thing because the conclusion cannot be otherwise, if there has been demonstration in the unqualified sense'.

particular terms do not allow this type of ambiguity and hence do not require qualifications.[167] In support of this line Kirwan argues that if we accept Duminil and Jaulin's interpretation two difficulties remain unresolved. First, the role of ἁπλῶς in *Met* V 9, 1017b35-1018a2, remains quite mysterious; by contrast, he translates it as 'baldly, i.e. without any additional 'some''. Second, the claim immediately following at 1018a2-4, also remains unexplained, and in particular it is not explained why it is not linguistic practice to say 'every Socrates' although it is so to say 'every man'. In sum the reading suggested by Bonitz and Kirwan appears more natural.

[167] Bonitz explains this meaning of ἁπλῶς in *Met* V 5 more extensively in the *Index*, 77a38ff: 'Eodem sensu ἁπλῶς usurpatur non addditis vocabulis vel synonymis, veluti αποδεδείκται ἁπλῶς'.

## 2. Identity *Per Se*

At 1018a5 Aristotle claims that there is an equivalence between being one *per se* and being the same *per se*; this point is however a matter of controversy both because the text is corrupted and because the commentators diverge in their readings. The manuscripts **E** and **J** transmit the following line:

**T 1:** τὰ δὲ καθ' αὑτὰ ὅσα ὥσπερ καὶ τὸ ἕν·

Schwleger edits a different text on the ground of the testimony of $\mathbf{A}^{b}$ and Asclepius' commentary (*In Met* 320, 16):

**T 2**: τὰ δὲ καθ' αὑτὰ, ὥσπερ καὶ τὸ ἕν·

The modern editors Ross and Jaeger on the other hand agree on the following text:

**T 3**: τὰ δὲ καθ' αὑτὰ ὁσαχῶσπερ καὶ τὸ ἕν·

The adverb ὁσαχῶσπερ is a correction by Jaeger justified on the basis of Alexander's commentary (*In Met* 377, 17-8) which reads:[168]

**T 4**: τὰ δὲ καθ' αὑτὰ ταὐτὰ ἀλλήλοις λεγόμενα τοσαυταχῶς φησι λέγεσθαι ὁσαχῶς καὶ τὸ καθ' αὐτὸ ἕν.

Although the choice of one variant or the other does not significantly change the literal meaning of the sentence, some variants are relevant in a broader context to the issue of whether there is, and how close it is, correspondence between the accounts Aristotle gives of being the same *per se* and being one *per se* in *Met* V 9 and 6 respectively. First of all, the comparison between **T 1-4**, which are numbered according to the chronological order in which they have been suggested, shows that in

[168] Immediately after this remark, at 377, 18-22, Alexander observes that Aristotle does not give in *Met* V 9 all the meanings of 'being the same *per se*' which corresponds to the ones of 'being one *per se*' either because the complete series of meanings already appears in *Met* V 6 or because the series of meanings give in *Met* V 6 may be reduced to the shorter series that appears in V 9. The former hypothesis is suggested by Bonitz too (*In Met* 245): 'Aristoteles omissis quas antea exposuit distinctionibus satis habet praecipuas eius notionis significationes memorasse'.

time there has evolved a more interpretative reading of the text. The text **T 1** transmitted by the most authoritative manuscripts, **E** and **J**, as it stands, does not emphasise the correspondence between sameness and oneness *per se*. **T 2**, which receives some authority from Asclepius' commentary, allows a generic correspondence between one-ness and sameness, facilitated by ὥσπερ. (**T 2** is the text that fits bets with Kirwan's, Duminil's and Jaulin's interpretation).[169] **T 3**, supported by Alexander's comments *ad locum*,[170] certainly suggests through ὁσαχῶσπερ a strong correspondence between *Met* V 6 and 9. If, in my view, one accepts Jaeger's amendment, the text indeed reads more clearly, and makes explicit the correspondence with *Met* V 6. In fact, however, a close comparison between *Met* V 6 and 9 shows, as it will appear in the next section, that the correspondence between accounts of sameness and accounts of one-ness *per se*, is not straightforward. My suggestion is that what the two chapters have in common are the criteria Aristotle uses for oneness and sameness, but not *ipso facto* the two classifications of the concepts.

Sameness is investigated in *Met* V 9 according to the two-fold distinction between *per se* and *per accidens* which is at work in *Met* V 6 too. This observation acquires significance in view of the fact that Aristotle elsewhere has also another perspective of investigation on sameness, for instance in *Met* X 3, 1054a32-b3. The comparative analysis of *Met* V 9 and IX 3 shows that Aristotle has (at least) two principles for classifying types of identity; let us call **C.1** the one having sameness *per se* as the focal type of identity, and **C.2** the other with numerical oneness (κατ' ἀριθμὸν or ἀριθμῷ) as the focal type of identity. The suggestion I want to put forward is that while in *Met* X 3 Aristotle makes use only of **C.1**, in *Met* V 6 and 9 the two criteria are interwoven and hence create interpretative difficulties. I will

---

[169] Kirwan (1971: 150-1): 'Nothing here or elsewhere corresponds to the sense of 'one' at V 6. 1016b11-17...The sameness of things whose matter is one in form answers to V 6. 1016b17-24, but the correspondence is not exact...The same objection faces Ross's suggestion that the sameness of things whose matter is one in number corresponds with oneness in continuity, V 6. 1015b36-1016a17'. For Kirwan, the choice of textual variant is not an issue: 'The corrupt readings of our manuscripts convey the same sense'. Duminil and Jaulin (1991) find preferable **T 2** and even consider 'suspicious' the parallelism between *Met* V 6 and 9: 'En effet, si l'on confronte le texte de 1016b31-35 avec le présent texte, on constate non seulement une différence de nombre de cas, ce qui remet en question le 'autant', mais aussi une différence des critères de classement, de nature à remettre en cause la 'façon''.

[170] Some support to Jaeger's emendation comes also from the fact that ὁσαχῶσπερ has only two other occurrences in Aristotle's works and both of them are also in Met V (7, 1017a23 and 17, 1022a11. See Bonitz *Index* 532b28.

develop my suggestion in three steps. Firstly, I will argue that for Aristotle sameness *per se* is not equivalent in definition to oneness in number, and it is legitimate to distinguish the two criteria **C.1** and **C.2**. Secondly, I will briefly recapitulate the results of my analysis of *Met* V 6 to show that **C.1** is the prevalent criterion at work there, but in section 1016b31-1017a3 there is a change to **C.2**, and the combination of the two criteria generates a reduplication of the classification of accounts of one-ness in the same chapter. Finally, I will give a detailed examination of the classification of accounts of identity in *Met* V 9. The crucial passage for the comparative analysis with *Met* V 6 and X 3 that shows that Aristotle has two criteria for identity is the following:

καὶ τὰ μὲν οὕτως λέγεται ταὐτά, τὰ δὲ καθ' αὑτὰ ὁσαχῶσπερ καὶ τὸ ἕν· καὶ γὰρ ὧν ἡ ὕλη μία ἢ εἴδει ἢ ἀριθμῷ ταὐτὰ λέγεται καὶ ὧν ἡ οὐσία μία

The two main accounts of sameness are sameness in matter and sameness in substance,[171] which are correlated in the passage by καὶ...καὶ; while the subordinate distinction of sameness in matter in form and in number are correlated by ἢ...ἢ, giving the following classification:

i. sameness because of oneness in matter
   i.i in species or form
   i.ii in number
ii. sameness because of oneness in substance

Let us now consider the classification of sameness in *Met* X 3, 1054a32-b3:

λεγομένου δὲ τοῦ ταὐτοῦ πολλαχῶς, ἕνα μὲν τρόπον κατ' ἀριθμὸν λέγομεν ἐνίοτε αὐτό, τὸ δ' ἐὰν καὶ λόγῳ καὶ ἀριθμῷ ἓν ᾖ, οἷον σὺ σαυτῷ καὶ τῷ εἴδει καὶ τῇ ὕλῃ ἕν· ἔτι δ' ἐὰν ὁ λόγος ὁ τῆς πρώτης οὐσίας εἷς ᾖ, οἷον αἱ ἴσαι γραμμαὶ εὐθεῖαι αἱ αὐταί, καὶ τὰ ἴσα καὶ ἰσογώνια τετράγωνα, καίτοι πλείω· ἀλλ' ἐν τούτοις ἡ ἰσότης ἑνότης.

[171] The meaning of substance in this context will be discussed in the following paragraphs.

'The same' has several meanings; (1) we sometimes mean 'the same numerically'; again, (2) we call a thing the same if it is one both in definition and in number, e.g. you are one with yourself both in form and in matter; and again, (3) if the definition of its primary essence is one; e.g. equal straight lines are the same, and so are equal and equal-angled quadrilaterals; there are many such, but in these equality constitutes unity.

In the passage just quoted, Aristotle distinguishes three accounts of sameness:

i. sameness in number

ii. sameness in definition and number

iii. sameness in definition of the primary substance

I understand 'primary substance' in this context as essence, following Bonitz' suggestion (*In Met* 425), on the grounds of *Met* VII 7, 1032b1-2: εἶδος δὲ λέγω τὸ τί ἦν εἶναι ἑκάστου καὶ τὴν πρώτην οὐσίαν.[172]

It is apparent that the two classifications in *Met* V 9 and X 3 do not fully overlap; the accounts given in *Met* X 3 do not all fall either under accidental sameness or under *per se* sameness. Sameness in number but not in definition is a case of accidental sameness, according to the majority of commentators, who see it in connection with the first account of accidental oneness in *Met* V 6, 1015b17-34 (see e.g. Ross 1924: 287). Sameness both in number and in definition and sameness in definition are cases of essential sameness. Furthermore, sameness only in number in *Met* X 3 is given as an independent criterion for sameness, while in *Met* V 9 it is a specification of the criterion for sameness in matter. Hence, not everything that is the same in number (*Met* X 3) is also *ipso facto* the same *per se* (*Met* V 9), and *vice versa*; sameness *per se* and sameness in number have different definitions, and give rise to different classifications of sameness. Hence, there are grounds for differentiating **C.1** from **C.2** as I suggested above. The question to address now is whether Aristotle himself keeps the two criteria apart. In *Met* V 6 Aristotle appears to have made the choice of employing **C.1**, but, unexpectedly, at 1016b31-1017a3, introduces a classification of accounts of sameness which in fact follows from **C.2** rather than from **C.1**. As I have pointed out in commenting on that passage this second classification creates reduplication and a lack of clarity in Aristotle's line of

[172] Bonitz (*loc cit*) explains πρώτη οὐσία as 'primaria rei natura, qua quid sit res definiatur seiunctis omnibus accidentibus'.

investigation in *Met* V 6. Some commentators emphasise the heterogeneity of that passage with the rest of the chapter. But there is not enough evidence available to take a position on whether Aristotle introduces the two classifications juxtaposing the two criteria in the same chapter because he was not clearly aware of the distinction between **C.1** and **C.2** or for other reasons. To recapitulate, here is a comparative presentation of the two classifications in *Met* V 6:

First classification:

i. oneness by continuity
ii. oneness in substratum
    ii.i oneness in material substratum
    ii.ii oneness in genus
iii. oneness by indivisibility
    iii.i indivisibility of definition
    iii.ii indivisibility in general

Second classification:

i. oneness in number
ii. oneness in species
iii. oneness in genus
iv. oneness by analogy

Having highlighted, in brief, analogies and differences in Aristotle's investigation between *Met* V 9 and the two most relevantly connected passages, *Met* V 6 and X 3, I will now focus on a closer examination of Aristotle's treatment of sameness *per se* in *Met* V 9. Aristotle gives two main accounts of sameness *per se*: oneness in matter and oneness in substance. Oneness in matter is explained by either oneness in number in the sense of sameness in the quantity of matter, or oneness in species of matter, in the sense of sameness in the type of matter.[173] (I shall return on the topic of sameness in matter and in substratum in chapter 5 and 6). In the case of sameness in type of matter there is correspondence between this account and the one

[173] Duminil and Jaulin (1991: 196) find the account of sameness at 1018a6 problematic. For, given the equivalence between oneness in number and oneness in matter Aristotle mentions in *Met* V 6, 1016b33, Aristotle's claim that 'ce dont la matière est une, soit par la forme, soit par nombre' in their interpretation means 'matière une, soit par la forme, soit par la matière'. They find this definition circular because matter is mentioned both as *definiens* and *definiendum*. To avoid attributing circularity to Aristotle's definition, Duminil and Jaulin think that we need to asssume Aristotle is referring here to the account of genus as matter in *Met* V 28, 1024b8-9.

of sameness in substratum in the first classification in *Met* V 6, 1016a17-32.[174] In brief, in *Met* V 6 in the first classification oneness in substratum is differentiated in oneness in material substratum and oneness in genus: some things are said to be one *per se* because their material substratum does not show specific differences detectable to the senses (see comments *ad locum*); some other things are said to be one *per se* because they fall under the same genus, even if they have opposite specific differences. The correspondence between the accounts in *Met* V 6 and 9 does indeed hold in this case.

Now we come to the third account of sameness *per se* in *Met* V 9, which is sameness in substance. In this case too Aristotle's definition is extremely sketchy, and the interpretation of the text is problematic. Two interpretations are possible of the term οὐσία: Aristotle may intend 'form', or 'substance' meaning the composite of matter and form.

The former interpretation was suggested first by Alexander of Aphrodisias (*In Met* 377,35 – 378,1), and appears plausible in the light of the comparison with *Met* X 3, 1054b1. On this reading, this account of sameness *per se* corresponds to the third account of oneness *per se* in the first classification in *Met* V 6. This is oneness by indivisibility. In this case the parallelism between *Met* V 9 and X 3 finds support in the comparison with *Met* V 6. Assuming the correspondence between the third account of sameness *per se* in *Met* V 9 and the third account of oneness *per se* in *Met* V 6, and in view of the fact that the third account of oneness *per se* in *Met* V 6 is illustrated by Aristotle with the same example that is used to illustrate the third account of sameness in *Met* X 3, it is plausible to extend the parallelism between *Met* V 6 and 9 to *Met* X 3 as well. In *Met* V 6 Aristotle uses as an illustration of oneness *per se* the indivisibility of geometric figures of the same type. In *Met* X 3 sameness in definition of the primary substance is exemplified by the case of equal straight lines and congruent quadrilaterals. These geometrical entities may be distinguished one from the other because they have different quantities of intelligible matter although they are qualitatively of the same type (as in the case of similar geometrical

[174] See also Ross (1924: 312): 'The reference to ὕλη in the present classification (1018a6) indicates that this list has greater affinities with the list of types of unity in ch. 6'. Also, Dubois (1998: 84): 'Dans le présent chapitre de V, la référence à la matière (1018a6) donne à penser que la présente liste est assez voisine de celle que nous avons lue au chapitre 6 (1015b16-1016b6)'.

figures), or because they occupy a different place in space although they have the same quantity and type of intelligible matter (as in the case of congruent geometrical figures).

On the other hand, on a different interpretative hypothesis, it is possible to understand sameness in οὐσία as sameness in matter and form, as in the second account of identity in *Met* X 3. In that context Aristotle gives at 1054a34-5 a general definition of identity in terms of καὶ λόγῳ καὶ ἀριθμῷ, but in the example (the identity between one and oneself) the identity is described in terms of καὶ τῷ εἴδει καὶ τῇ ὕλῃ. On the assumption, shared by all commentators, that the two descrptions are to be taken as equivalent, λόγῳ corresponds to εἴδει and ἀριθμῷ to ὕλῃ. Hence, the three accounts of sameness in *Met* X 3 describe respectively: i) sameness in matter only, ii) sameness in matter and form, iii) sameness in form only. The correspondence between the second account of sameness in *Met* X 3 and the third account of sameness *per se* in *Met* V 9 is supported by the fact that in both chapters Aristotle uses the example of self identity, which evidently involves sameness in form and in matter. Furthermore, this interpretation of the third account of sameness *per se* in *Met* V 9 is strengthened by the fact that in *Soph El* 24 Aristotle refers to this type of sameness by using precisely the term οὐσία.[175]

Having discussed two plausible interpretations for the passage under examination from *Met* V 9, in conclusion there appears to be equally strong evidence in support of either interpretation; hence no preference of the one over the other seems to be justified.

Proceeding with the analysis of the text, Aristotle, just after the exposition of the various accounts of sameness, repeats at 1018a7-9 once again the interdependence between oneness and sameness:

ὥστε φανερὸν ὅτι ἡ ταυτότης ἑνότης τίς ἐστιν ἢ πλειόνων τοῦ εἶναι ἢ ὅταν χρῆται ὡς πλείοσιν, οἷον ὅταν λέγῃ αὐτὸ αὑτῷ ταὐτόν·

[175] *Soph El* 24, 179a37-9: μόνοις γὰρ τοῖς κατὰ τὴν οὐσίαν ἀδιαφόροις καὶ ἓν οὖσιν ἅπαντα δοκεῖ ταὐτὰ ὑπάρχειν. For only to things that are indistinguishable and one in essence (κατὰ τὴν οὐσίαν) is it generally agreed that all the same attributes belong. For a discussion on this passage and on the potential contrast with *Top* VII 1, 152a33-7, see e.g. Lewis (1982), Mariani (2000), Mignucci (1985).

Clearly, therefore, sameness is a unity of the being either of more than one thing or of one thing when it is treated as more than one, i.e. when we say a thing is the same as itself; for we treat it as two.

The use of the abstract terms ταυτότης and ἑνότης, which are rarely found in Aristotle's works,[176] in place of the nominalized adjective in the neuter may indicate that Aristotle is giving here a sort of classification of concepts.[177] We may speculate that Aristotle sees sameness as a type (τίς) of oneness, i.e. as a species under the genus oneness. The use of abstract terms for expressing a relation between concepts analogous to the genus-species one finds support in other passages in which Aristotle uses abstract terms to classify concepts: e.g. when talking about oneness as ὁλότης in relation to oneness in general in *Met* V 26 (1023b36: ὡς οὔσης τῆς ὁλότητος ἑνότητός τινος); when talking about equality in relation to oneness in general in *Met* X 3 (1054b3: ἐν τούτοις ἡ ἰσότης ἑνότης); when talking about being different from and contrary to in *Met* X 8 (1058a16: ἡ ἄρα διαφορὰ ἐναντίωσίς ἐστιν).

If this interpretation is correct, we can revisit in the light of it Kirwan's and White's argument (discussed in chapter 2) to the effect that Aristotle confuses the monadic and dyadic uses of oneness, regarding respectively the intrinsic unity of a single item and the identity relations between two or more items.[178] Kirwan's and White's argument is primarily grounded in their analysis of *Met* V 6 but finds corroboration, from their point of view, in the very passage of *Met* V 9 I have been discussing so far.[179] White (1971: 187-8) for instance interprets the passage thus: 'To say that X is the same as X is just to say that X is one with X; but this is to say that X and X (together) constitute one thing, and this in turn is to treat X as two things going to make up one thing'. By contrast, in my interpretation of *Met* V 9 Aristotle shows awareness of the fact that oneness and sameness are not in principle fully equivalent when he says that sameness is a type (species) of oneness (genus).

---

[176] See Bonitz *Index* 253a22-4 and 748b49-51.

[177] *Contra* Kirwan (1971: 150) who holds Aristotle is making a linguistic point about the interchangeability of the terms 'one' and 'the same': ''Sameness is a kind of oneness' because any statement using 'same' can be rephrased using 'one'. Aristotle appears to maintain that the converse is also true when he says that things are called the same in their own right 'in as many ways' as they are called one...It is hard to see justification for the latter claim'.

[178] For a discussion of these two uses see also (Miller 1973: 483-90).

[179] Kirwan (1971: 134), White (1971: 177-97; 1986: 475-94).

### 3. Otherness, difference, similarity, dissimilarity

After the discussion on sameness, Aristotle deals, very briefly, with its opposite: otherness, at 1018a9-11:

> ἕτερα δὲ λέγεται ὧν ἢ τὰ εἴδη πλείω ἢ ἡ ὕλη ἢ ὁ λόγος τῆς οὐσίας· καὶ ὅλως ἀντικειμένως τῷ ταὐτῷ λέγεται τὸ ἕτερον.

As Bonitz (*In Met* 245), Ross (1924: 312-3),[180] and Duminil and Jaulin (1991:197) note, this passage is to be integrated by the remarks Aristotle makes on the nature of this opposition in *Met* X 3, 1054b19-23. Sameness and otherness are not to be taken as mutually contradictory, as Aristotle explains there:

> 'Other or the same' can therefore be predicated of everything with regard to everything else-but only if the things are one and existent, for 'other' is not the contradictory of 'the same'; which is why it is not predicated of non-existent things (while 'not the same' is so predicated). It is predicated of all existing things; for everything that is existent and one is by its very nature either one or not one with anything else.

From a comparison between the classifications of sameness *per se* and of otherness, it is clear that there is no one-to-one correspondence, as shown:

| Sameness *per se* | | Otherness |
|---|---|---|
| i. | Sameness in matter | j. Otherness in species |
| | i.i in specie | jj. Otherness in matter |
| | i.ii in number | jjj. Otherness in definition of the substance |
| ii. | Sameness in substance | |

[180] Ross takes the relation between sameness and otherness as analogous to the relation between ἕξις and στέρεσις, possibly in view of *Met* X 7, 1057a33-7, where Aristotle distinguishes four types of opposition: contradiction, privation (στέρεσις), contrariety, and relation. On Ross' interpretation, the contrast Aristotle draws in *Met* V 9 between sameness and otherness is to be understood not generically but specifically as a relation of privation.

Ross (1924: 312), following a suggestion by Alexander of Aphrodisias (*In Met* 378: 19-22), believes that the two classifications may be reduced one to the other, in the following way:

k. Sameness in species of matter *versus* otherness in species

kk. Sameness *versus* otherness in the actual matter

kkk. Sameness *versus* otherness in substance

*Contra* Ross, Kirwan (1971: 151) rightly in my view points out that the first correspondence is not legitimate, for any two substances may be other in form but the same in form of matter, like e.g. a bronze sphere and a bronze cube.

The classification of accounts of otherness in *Met* V 9 is also problematic in the light of the comparison with the one in *Met* X 3, 1054b13-8:[181]

i. Being the opposite of being the same

ii. Being other in matter and form

iii. Being other as the objects of mathematics are

The first account in *Met* X 3 corresponds to the general definition of otherness on *Met* V 9 and is not in fact set against any account of sameness either in X 3 or in V 9. The second account in *Met* X 3 is to be contrasted with the second account of sameness introduced in the same chapter, i.e. sameness in substance, and with the third account of sameness *per se* in *Met* V 9, provided that this is taken as sameness in form and matter. The third account in *Met* X 3 is to be contrasted with the third account of sameness in the same chapter, i.e. sameness in the definition of the primary substance, which is exemplified by Aristotle with congruent geometrical figures, and with the third account of sameness *per se* in *Met* V 9, provided that this is understood as sameness in form.

In the conclusion of his analysis of sameness and otherness, Aristotle adds a brief remark at 1018a12-5, where he notes that the relations between things are not exhaustively described only by sameness and otherness, which are opposites. In *Met* V 9, 1018a12, 'different' is said to apply to things that are identical and at the same time non identical in different respects with other things. Two main accounts of

[181] *Met* X 3, 1054b13-8: 'Evidently, then, 'other' and 'unlike' also have several meanings. And the other in one sense is the opposite of the same (so that everything is either the same as or other than everything else). In another sense things are other unless both their matter and their definition are one (so that you are other than your neighbour). The other in the third sense is exemplified in the objects of mathematics'.

difference are given, separated by formula of transition ἔτι. In the first account there are four respects in which two things may differ (which correspond to the second classification of sameness in *Met* V 6, 1016b31-1017a3): number, form, genus, analogy. In the second account, things may differ in genus, or be opposites (within one genus), or differ in specific difference (within one genus).[182]

The interpretation of l. 1018a14 has been a matter of much controversy among commentators. For instance Bonitz (*In Met* 245-6) believes that Aristotle's exposition is loose in this passage and that l. 1018a14 is in fact superfluous to the discussion. Alexander of Aphrodisias e.g. (*In Met* 379, 15-24) proposes three possible interpretations. In the first Aristotle is referring only to the opposites, τὰ ἐναντία, and is using the expression ὅσα ἔχει ἐν τῇ οὐσίᾳ τὴν ἑτερότητα as epesegetic. In the second Aristotle mentions things that are opposites only in some respect (e.g. water as wet *versus* earth as dry). Dubois for instance (1998: 85) adopts this reading by Alexander. Finally, in the third possible interpretation offered by Alexander, Aristotle intends those things that have a common substratum but different definitions.

If we now turn to analyze specifically the first account that Aristotle gives of difference, we find the first interpretative difficulty at 1018a12-3 regarding the expression μὴ μόνον ἀριθμῷ on which the commentators widely disagree. The traditional interpretation, which is put forward first by Alexander (*In Met* 378, 30-4), states that what is different cannot be numerically one, hence Aristotle's expression makes sense only if understood with a concessive value, namely: those things are called different that are the same in some respects (i.e. in genus, species, or analogy) but not the same in other respects, provided that they are not different in number. Alexander (*In Met* 379, 5-7) also adds that being different in number is a necessary condition, along with sameness in some respect, for defining the notion of

[182] In *Met* V 14 Aristotle uses analogous expressions to the one used in V 9 to refer to specific difference and on these grounds I assume that in V 9 the term οὐσία means 'specific difference'. This interpretation is suggested also by Ross (1924: I 313), on the grounds of the comparison with *Met* X 8, 1058a7. See *Met* V 14, 1020a33-b1: 'Quality' means (1) the differentia of the essence, e.g. man is an animal of a certain quality because he is two-footed, and the horse is so because it is four-footed; and a circle is a figure of particular quality because it is without angles,-which shows that the essential differentia is a quality.-This, then, is one meaning of quality-the differentia of the essence.
See also *Met* X 8, 1058a6-8: ἀνάγκη ἄρα τὴν διαφορὰν ταύτην ἑτερότητα τοῦ γένους εἶναι. λέγω γὰρ γένους διαφορὰν ἑτερότητα ἢ ἕτερον ποιεῖ τοῦτο αὐτό.
This difference, then, must be an otherness of the genus. For I give the name of 'difference in the genus' an otherness which makes the genus itself other.

difference.[183] Alexander's interpretation is adopted also by Dubois (1998: 85) and by Bonitz (*In Met* 245). Bonitz finds further support for Alexander's reading in *Met* VI 1, 1025b27-8, where he finds an expression analogous in meaning and in form to the one in *Met* V 9: περὶ οὐσίαν τὴν κατὰ τὸν λόγον ὡς ἐπὶ τὸ πολὺ ὡς οὐ χωριστὴν μόνον (my emphasis).[184] *Contra* Bonitz, Ross (1924: 313) questions the parallelism between *Met* V 9 and VI 1 and is inclined to reject Bonitz' interpretation.[185] Kirwan (1971: 151) registers two more interpretations in the history of the tradition. The first is grounded in an entirely different reading of 1018a12-3: μὴ μόνον ἀριθμῷ is referred to ἕτερά rather than to τὸ αὐτό, and the passage is translated: 'other [in number] while being the same something', which is how Schwegler, for instance, understands the passage (*In Met* 218). The second interpretation mentioned by Kirwan assumes that even what is the same in number may be different in some aspect e.g. in the course of time. In conclusion, although the traditional interpretation seems not to have genuine textual support, the other interpretations mentioned by Kirwan do not offer more persuasive alternatives.

The first account of difference is twofold: one way things may differ is by belonging to different genera, the other way is by being specifically different although belonging to one and the same genus. In the first case things are only accidentally different,[186] in the second case things that share the same genus may be differentiated either by opposite determinations or by divisive differences. The distinction between opposite determinations and divisive differences is made on the

---

[183] *In Met* 378, 30-4: τὸ δὲ καὶ μὴ μόνον ἀριθμῷ προσέθηκε τῷ ταὐτό τι ὄντα ὡς ἴσον τῷ μόνον μὴ ἀριθμῷ ὄντα ταὐτά· τὰ γὰρ οὕτω ταὐτὰ οὐκέτι διαφέρειν δύναται. τὸ γὰρ ταὐτὸν τὰ διαφέροντα ἀλλήλων ἔχειν δεῖ μὴ κατ' ἀριθμόν (τὰ γὰρ οὕτω ταὐτὰ οὐ διάφορα).
*In Met* 379, 5-7: δεῖ τὰ διάφορα μὴ μόνον ἕτερα εἶναι ἀριθμῷ, ἀλλὰ καὶ κατά τι τὰ αὐτὰ ἀλλήλοις εἶναι, εἰ μέλλοι μὴ μόνον ἕτερα εἶναι ἀλλὰ καὶ διάφορα.

[184] *In Met* 245: Nam primum illud quidem recte docet, in τῷ διαφόρῳ ad notionem τοῦ ἑτέρου, quae eius est genus, unitatem quandam accedere, modo ne cogites (μὴ μόνον a12, quasi dicat μόνον μὴ, Alex. p. 340, 4, cf. E 1. 1025b28) unitatem numeri, sed vel speciei, vel generis vel analogiae unitatem'.

[185] Ross (1924: 313): 'οὐ χωριστὴν μόνον is, however, not a very close parallel to μὴ μόνον ἀριθμῷ, and it is doubtful whether it has the meaning corresponding to that which Alexander and Bonitz assign to μὴ μόνον ἀριθμῷ. A different reading and punctuation seem preferable in that passage.'

[186] In *Met* X 7, 1057a26-8 for instance Aristotle claims: μεταβάλλειν δ' ἐξ ἄλλου γένους εἰς ἄλλο γένος οὐκ ἔστιν ἀλλ' ἢ κατὰσυμβεβηκός, οἷον ἐκ χρώματος εἰς σχῆμα. ἀνάγκη ἄρα τὰ μεταξὺ καὶ αὐτοῖς καὶ ὧν μεταξύ εἰσιν ἐν τῷ αὐτῷ γένει εἶναι. 'But to change from one genus to another genus is not possible except in an incidental way, as from colour to figure'.

ground that the one is not in every case the same as the other, for divisive differences come in degrees, while opposite determinations do not.

In conclusion, Aristotle's discussion on difference in *Met* V 9 is extremely brief and sketchy; the same themes receive a philosophically deeper analysis in *Met* X 8-9. In particular, for example in *Met* X 8 we find a definition of what a specific difference is, at 1058a26-8: ἐναντίωσιν γὰρ ἀνάγκη εἶναι τὴν διαφορὰν οὗ διαφέρει εἴδει· αὕτη δὲ ὑπάρχει τοῖς ἐν ταὐτῷ γένει οὖσι μόνοις.[187] In *Met* X 9 Aristotle argues that specific differences are determined only by the oppositions that concern the form, at 1058b1-2: τὸ μὲν λόγος τὸ δ' ὕλη, ὅσαι μὲν ἐν τῷ λόγῳ εἰσὶν ἐναντιότητες εἴδει ποιοῦσι διαφοράν.[188]

The second part of *Met* V 9 is devoted to discussion of likeness and unlikeness. Aristotle distinguishes four degrees of similarity things may have with each other, ordered from the strongest to the weakest:

i) by having all the same attributes

ii) by having more attributes the same than different

iii) by being of the same quality

iv) by sharing the greater number or the more important of the attributes (each of the attributes being one of two contraries)

In *Met* X 3, 1054b3-13 returns to the topic of similarity and offers a different and more accurate classification, to which Ross (1924: 313-4) believes the one in *Met* V 9 can be reduced to. According to *Met* X 3 things are similar if:

---

[187] Aristotle explains more extensively what a specific difference in *Met* X 8, 1057b35-1058a8: 'That which is other in species is other than something in something, and this must belong to both; e.g. if it is an animal other in species, both are animals. The things, then, which are other in species must be in the same genus. For by genus I mean that one identical thing which is predicated of both and is differentiated in no merely accidental way, whether conceived as matter or otherwise. For not only must the common nature attach to the different things, e.g. not only must both be animals, but this very animality must also be different for each (e.g. in the one case equinity, in the other humanity), and so this common nature is specifically different for each from what it is for the other. One, then, will be in virtue of its own nature one sort of animal, and the other another, e.g. one a horse and the other a man. This difference, then, must be an otherness of the genus. For, I give the name of 'difference in the genus' an otherness which makes the genus itself other'.

[188] What I quoted above is the conclusion of Aristotle's argument, which is developed at 1057b34-1058a3: 'This question is almost the same as the other, why one contrariety makes things different in species and another does not, e.g. 'with feet' and 'with wings' do, but paleness and darkness do not. Perhaps it is because the former are modifications peculiar to the genus, and the latter are less so. And since one element is definition and one is matter, contrarieties which are in the definition make a difference in species, but those which are in the thing taken as including its matter do not make one'.

i) not being absolutely the same, nor without difference in respect of their concrete substance, they are the same in form;

ii) having the same form, and being things in which difference of degree is possible, they have no difference of degree;

iii) the qualities they have in common are more numerous than those in which they differ-either the qualities in general or the prominent qualities

# Chapter 5: The Two-in-One Model in Aristotle's Theory of Causation

## Introduction

The long history of philosophy has seen many formidable attempts at the analysis of causation. Necessary connection, counterfactual dependence, nomological subsumption, statistical correlation, and other core conceptions have been used in seeking to account for the relation between a cause and its effect. In view of the centrality this relation has enjoyed in metaphysics on the one hand, and the immense amount of exegetical study that has been devoted to Aristotle's works on the other, it is surprising that Aristotle's unique analysis of causation has not been recognised as a chapter in the history of this concept. His analysis is fundamentally different from any other that has left its mark; and because his account has remained hitherto latent, it might even provide a promising new starting-point for us in tackling this elusive metaphysical notion.

Aristotle takes causation to be the occurrence of a complex entity. The entity comprises a physical process grounding two natures (e.g. building and being built). The two natures are ontologically interdependent, requiring a mutual process of realisation. But the potentialities for the two natures belong, respectively, to two different substances, the agent and the patient, and so, in consequence, do the two natures themselves. Aristotle builds a causal bridge between substances out of potential properties of substances which are mutually realised. Their mutual realisation binds them together into a net of ontological dependencies which delineates the boundary of the causal entity. So, from one point of view, a causal interaction consists in two objects realising two properties which they have in potentiality; from another point of view, their realisation is a physical activity which is itself essentially characterised by two natures. Potentiality, actuality, and ontological dependence suffice to bridge the two substances causally, without introducing any additional metaphysical causal cement to do the job.

Aristotle examines the relation between cause and effect by analysing the relation between mover and movable, in his discussion of κίνησις (change, motion) in *Physics* III. Although his definition of κίνησις (see e.g. 201a9-10, 201a27-9;

201b4-5; 202a13-4)[189] allows for a very wide span of instances to come under the mover-movable relation, including such cases as aging or ripening, central in Aristotle's discussion are cases that we would readily treat as instances of causal relations, such as building, heating, doctoring, etc. I shall therefore talk of the relation of a mover to the movable as a causal relation, despite the fact that for Aristotle it also includes what we would consider untypical cases of it.

Fundamental in his search for an understanding of motion is the assumption that an ontological account of motion will not require a new, primitive category of being, as he says at 200b32-201a3:

> οὐκ ἔστι δὲ κίνησις παρὰ τὰ πράγματα· μεταβάλλει γὰρ ἀεὶ τὸ μεταβάλλον ἢ κατ'οὐσίαν ἢ κατὰ ποσὸν ἢ κατὰ ποιὸν ἢ κατὰ τόπον, κοινὸν δ' ἐπὶ τούτων οὐδὲν ἔστι λαβεῖν, ὡς φαμέν, ὃ οὔτε τόδε οὔτε ποσὸν οὔτε ποιὸν οὔτε τῶν ἄλλων κατηγορημάτων οὐθέν· ὥστ' οὐδὲ κίνησις οὐδὲ μεταβολὴ οὐθενὸς ἔσται παρὰ τὰ εἰρημένα, μηθενός γε ὄντος παρὰ τὰ εἰρημένα.
>
> There is no such thing as motion over and above the things. It is always with respect to substance or to quantity or to quality or to place that what changes changes. But it is impossible, as we assert, to find anything common to these which is neither 'this' nor quantity nor quality nor any of the other predicates. Hence neither will motion and change have reference to something over and above the things mentioned; for there *is* nothing, over and above them.

This programmatic stance will play a role in directing Aristotle's account of the ontology of causation. In particular, instead of introducing new entities he will make use of his three principles, the form, the privation and the substratum that remains through change. Furthermore, he will use his distinction between being in potentiality and being in actuality, which is a primitive distinction of ways in which things are (see e.g. *Phys* III 1).[190] But even though he will not introduce new

[189] *Phys* III 1, 201a9-10: The fulfilment of what exists potentially, in so far as it exists potentially, is motion. *Phys* III 1, 201b4-5: It is the fulfilment of what is potential when it is already fully real and operates not as itself but as movable, that is motion. *Phys* III 3, 202a13-4: [motion] is in the movable...It is the fulfilment of this potentiality, and by the action of that which has the power of causing motion'.

[190] *Phys* III 1, 201a9-10: We have distinguished in respect of each class between what is in fulfilment and what is in potentiality.

metaphysical building blocks, causation will introduce something novel in his ontology. Aristotle will construct a new type of entity consisting of an *underlying substratum that has two natures*. This is a surprise in the context of Aristotelian substantial essentialism, where a substance is a composite of a material substratum and a single substantial form, as we have seen in the analysis of Aristotle's conception of substance in chapter 1. But in causation we are not concerned with the metaphysics of substances as such, but with the metaphysics of the causal interaction between them. These metaphysical relations involved in a causal activity constitute a new type of entity Aristotle uses in accounting for causation. The investigation of these relations has not been undertaken before in the exegetical tradition. For, the vast majority of the commentators, from Late Antiquity (Themistius, Philoponus, Simplicius) to the Middle Ages (Averroes, Aquinas),[191] on to nowadays (Ross, Gill, Waterlow, Hussey), puzzled by the position Aristotle takes in *Phys* III 3, read the crucial passage in which, in my view, he introduces the two natures out of which the causal entity is built as merely referring to two descriptions of one thing. But the textual evidence is in fact against this reading.

Aristotle explains causation in terms of the modifications the mover and the movable suffer in the causal process. He uses his aporetic method in developing the metaphysical details of his account, by presenting in *Phys* III 3 a dilemma regarding the actuality of the mover and the movable. This is a long and intricate argument, to which I shall refer as the Actualities of Motion Dilemma (202a21-b5), in the course of which Aristotle rehearses various metaphysical accounts of what happens to the mover and the movable in causal circumstances. He will reject some of these accounts, while introducing positions he will include in his own. I will use the argument eclectically in this exposition, drawing from it the elements that are useful for configuring Aristotle's own account; his own final position does not result from this argument, but we can better understand it in view of various considerations he introduces in the course of this argument. I provide an analysis of the logic of this argument in section 3 of this chapter.

[191] In a later commentary such as the one by Zabarella the issue of what the two beings that have one and the same reality are is not even raised. Without intending to generalise beyond the commentaries I have mentioned, I wish to note that there appears to be a tendency in the tradition to take Aristotle's position in *Phys* III 3 to be metaphysically quite straightforward, while, as we will see, it is far from being so.

In discussing the Dilemma here, I shall be concerned mainly with the way Aristotle understands the problem of the relation of a mover to a movable. I will first identify the questions he thinks need to be addressed in giving a satisfactory answer to the problem, and then examine the solutions he gives, thereby developing his own theory of causation. The starting point of Aristotle's account is the cause of motion, see 202a9-12:

> εἶδος δὲ ἀεὶ οἴσεταί τι τὸ κινοῦν, ἤτοι τόδε ἢ τοιόνδε ἢ τοσόνδε, ὃ ἔσται ἀρχὴ καὶ αἴτιον τῆς κινήσεως, ὅταν κινῇ, οἷον ὁ ἐντελεχείᾳ ἄνθρωπος ποιεῖ ἐκ τοῦ δυνάμει ὄντος ἀνθρώπου ἄνθρωπον.
>
> The mover will always transmit a form, either a 'this' or such or so much, which, when it moves, will be the principle and cause of the motion, e.g. the actual man begets man from what is potentially man.

The core conception in Aristotle's account of causation is the transmission of the form from the mover to the movable, e.g. from the actual person to the potential one. During the causal interaction changes take place in the movable, but may also take place in the mover due to its engagement in moving the movable.[192] But the causal interaction is the transference of the form from the mover to the movable. Since causal efficacy consists in the transmission of the form, whatever happens to the mover in transmitting the form is not its causal agency, because the mover is not transmitting the form it itself; the causal efficacy of the mover impacts only on the movable.[193]

The metaphysical mechanism of the transference of form is innovative and complex. To reach Aristotle's metaphysical innovation we need to first examine what occurs in the mover and what in the movable during the causal interaction. The mover moves in actuality, and the movable is actually moved. These two actualities

---

[192] Although changes may take place in the movable only, and not in the mover: 'It *is* possible for a thing [e.g. the prime mover] to cause motion, though it is itself incapable of being moved' (201a27), they may take place also in the mover: 'every mover too is moved, as has been said – every mover, that is, which is capable of motion' (202a3-4).

[193] 'To act on the movable as such is just to move it' (202a5-6); Aristotle continues: 'But this it does by contact, so that at the same time it [the mover] is also acted on' (a6-7). This remark explains the motion of the mover as a reciprocal impact it suffers by the necessary contact with the movable.

are not casually coincident. The occurrence of the first is responsible for the occurrence of the second, so their coincidence needs to be ontologically explained.

Aristotle explores the elusive relation between the two actualities (of the mover as a mover and of the movable as movable) in his dialectical puzzle about the Actualities of Motion. In brief, he considers two possibilities: that the two actualities are different, or that they are one and the same. If they are different, either both actualities occur in one of the two, either the mover or the moved, or one occurs in each. If both the actualities occur in one of them, then, first, one of them will not have its own actuality realised in it; e.g. the actuality of the mover will occur in the moved, not in the mover; but how could that be? And secondly, whatever has both actualities in it will change in two different ways in relation to one form.[194] If on the other hand the actuality of the mover is in the mover, and the actuality of the movable is in the movable, then either the causal agency of the mover will impact on the mover itself, not the movable, or it will impact on nothing, in which case it is not being a mover in actuality. Finally, if the actualities of the mover and the moved are the same, then we reach absurdity, since agency and patiency cannot be the same. I will selectively discuss certain points in this argument which relate to important issues for the metaphysics of Aristotle's account of causation.

I will first consider the role of the form (εἶδος) in Aristotle's account of causation. There are three interrelated sub-themes. First, there is the transmission of the form from the mover to the movable (202a9-12). Secondly, the actuality of the mover and the actuality of the moved are in relation to one form, the transmitted one.[195] And finally, these two actualities are of different types.[196] The form that is the principle and cause of the motion is the form that is transmitted from the mover to the movable. For example, the causal efficacy of fire consists in its transmitting the

---

[194] E.g. it will become more and less hot at the same time.

[195] This tenet is presupposed by the rhetorical question Aristotle asks: 'How will there be two alterations of quality in *one* subject towards *one* form? (202a35-36). See **P (5.2)** in the Dilemma in the *Appendix*.

[196] See *Phys* III 3, 202b1-5. Here Aristotle distinguishes teaching from learning, not because the content of the lesson is different, but because the one activity is teaching, and the other is learning, the same lesson. Contrast e.g. Themistius (*In Phys* 78, 9-23), who in his interpretation confuses the content of teaching and learning and the common underlying substratum for both. Themistius talks about the very same theorem being taught and learned as an example of the common substratum of teaching and learning, and assimilates it to the stretch of path for the roads from Athens to Thebes and from Thebes to Athens. But this mistakes what is common in the forms of moving and tbeing moved with what underlies the activities of moving and being moved.

form of heat to the pot. It follows that the motion suffered by what is movable consists in the reception of the form that is transmitted to it. So the mover's being a mover and the movable being moved will be achieved in relation to one form (εἰς ἓν εἶδος, 202a35-6). But since the mover transmits and the movable receives the form, their achievements are of different types,[197] because they relate to the same form differently. Thus the actuality of the mover as a mover *is* the transmission of the form, and the actuality of the movable as movable *is* the reception of that form.

The second issue that arises out of the Dilemma of the Actualities of Motion is the distinction Aristotle makes between the subjects the actualities occur in and the subjects they belong to. Here, as we shall see, Aristotle's metaphysical intuitions are tested to the extreme, and he finally opts for an account that opens new ground in the area of causation. Aristotle raises the issue of where the actualities *of* the mover as mover, the action, and *of* the movable as movable, the passion, are, i.e. whether they are *in* the mover or *in* the movable (ἐν τίνι; 'in what?', 202a25). By asking *in what* the action *of* the agent and the passion *of* the patient are, he distinguishes in one and the same question two metaphysical relations: the one is 'belonging to a subject' and the other is 'occurring in a subject'.[198] We need to examine why this distinction arises here, and how it can be understood.

Let us first look at Aristotle's own attempt to justify the distinction. He says:

> ἐπεὶ οὖν ἄμφω κινήσεις, εἰ μὲν ἕτεραι, ἐν τίνι;
>
> Since then they are both [the agent's action and the patient's passion] motions, we may ask: in what are they? (202a25)
>
> ἢ οὔτε τὸ τὴν ἄλλου ἐνέργειαν ἐν ἑτέρῳ εἶναι ἄτοπον (ἔστι γὰρ ἡ δίδαξις ἐνέργεια τοῦ διδασκαλικοῦ, ἕν τινι μέντοι, καὶ οὐκ ἀποτετμημένη, ἀλλὰ τοῦδε ἐν τῷδε)

[197] 202b1-3 'It is contrary to reason to suppose that there should be one identical actualisation of two things which are different in kind. Yet there will be, if teaching and learning are the same, and agency and patiency'. See **P 15** in the Dilemma in the final section of this chapter.

[198] Being 'in a subject' in the context of *Phys* III 3 should not to be understood along the lines of inherence in the *Categories*, as, for instance, red inheres in an apple. The reason is that the *Categories'* inherence in the substance entails belonging to that substance as subject; whereas, as we shall see, here, e.g. heating something belongs to the fire but occurs in the pot.

> It is not absurd that the actualisation of one thing should be in another. Teaching is the activity of a person who can teach, yet the operation is performed in something – it is not cut adrift from a subject [the teacher], but is *of* one thing [the teacher] *in* another [the learner]. (202b5-8, my emphasis)

The first passage makes a general point, too broad to be illuminating in the present circumstances. It tells us that in relation to motions we can ask the question of where they take place. Thus, my walk can take place in the park, and my tanning at the seashore. But in neither case am I doing something (at least in any way significant) to, or changing, that in which my motion takes place. My walk and my tanning are external to the park and the seashore. They are 'in' them in a local sense, which must not be the point Aristotle wants to make, if he is to distinguish e.g. my tanning taking place in the seashore from its taking place in me, who tans.[199] The second passage gives us a clearer idea of the type of distinction that Aristotle has in mind. He concentrates on one of the two actualities, the agent's, and says that teaching is performed by the teacher in something. If this is to be more illuminating than the first passage, we must take Aristotle to be saying something other than that teaching takes place in a classroom. Indeed he does tell us that teaching takes place in the learner. But how is this to be understood, and generalised?

A clue as to what Aristotle means by talking of where an action takes place can be found in a sub-argument in the Dilemma (**P 9-12** in the argument analysis), in the following dialectical move, at 202a26-31:

> ἢ γὰρ ἄμφω ἐν τῷ πάσχοντι καὶ κινουμένῳ, ἢ ἡ μὲν ποίησις ἐν τῷ ποιοῦντι, ἡ δὲ πάθησις ἐν τῷ πάσχοντι (εἰ δὲ δεῖ καὶ ταύτην ποίησιν καλεῖν, ὁμώνυμος ἂν εἴη). ἀλλὰ μὴν εἰ τοῦτο, ἡ κίνησις ἐν τῷ κινοῦντι ἔσται (ὁ γὰρ αὐτὸς λόγος ἐπὶ κινοῦντος καὶ κινουμένου), ὥστ' ἢ πᾶν τὸ κινοῦν κινήσεται, ἢ ἔχον κίνησιν οὐ κινήσεται
>
> [Suppose] the agency is in the agent and the patiency in the patient. [Then] … the motion will be in the mover, for the same account will hold of mover and movable. Hence either *every* mover will be moved, or, though having motion, it will not be moved.

[199] Contrast Hussey *ad locum* who holds that 'there is nothing to suggest that anything other than a local sense of 'in' is intended' (1982: 65).

The key ideas in this argument are that where the actuality of the mover as a mover is will also be where the motion is; and the thing the motion is in is set in motion. Aristotle's justification for the first claim, that motion follows the actuality of the mover as mover, is that the rationale here must be the same in the case of the movable. Because if, as per the initial hypothesis, the action of the mover moves the movable, then it must be that the action of the mover generates motion. But if the action of the mover is in the mover, the generated motion will, for that reason, also be in the mover. But then the mover will be in motion, for otherwise 'though having motion, it will not be moved', which is treated as absurd and closes this branch of the argument. So the motion is where the actuality of the mover as mover is, and where the motion is, it sets that thing in motion.

In that case we can interpret the question 'ἐν τίνι;' ('in what?', 202a25) as asking '*at what* is the motion directed?' Teaching is directed at a learner, heating at a colder object, and scratching at a surface, because it is these objects that are set in motion by the movers. So the actuality of the mover as mover is in the patient generating the motion in it. On the other hand, the actuality of the patient as patient is always in the patient because the patient always suffers the caused motion itself. The picture which emerges from the distinction of the two metaphysical relations, 'belonging to a subject' and 'occurring in a subject', is that there is a motion that is the coincidence of two activities, the agent's and the patient's, in the patient. I shall explore this metaphysical picture in the section 2 of this chapter

Before we come to this, a clarification is needed regarding whether the mover itself is in motion. We have seen that Aristotle distinguishes the motion of the mover, due to necessary contact with the movable, from the motion in the movable due to the mover's causal efficacy. The first is in the mover and the second in the movable.[200] But there is a third, Cambridge, type of change that both the mover and

[200] In the sub-argument of the Dilemma examined above, the falsehood that closes one of the branches is that 'every mover will be moved' (202a30). See (**P 10.1**) in theargument analysis in section 3 of this chapter. This follows from the assumption that the mover's actuality, as a mover, is in the mover itself. Then, due to their self inflicted causal efficacy, all movers would move, which is treated as a falsehood, and so it is denied that the mover's actuality is in the mover. But although 'every mover will be moved' is treated as a falsehood in the Dilemma, Aristotle has earlier stated that 'every mover is moved' (202a3). The difference between the statements is that the second ranges over movable movers only, while the first ranges over all movers, including god, who is immovable, which falsifies

the movable undergo; namely they become respectively mover and moved. This is different from the change the mover suffers due to contact with the movable, since the mover would undergo the change into being a mover even if it moved the movable without contact with it (e.g. in the case of the prime mover). Similarly, the movable becomes moved as well as hot, or red or shaped.

---

the statement. Of course this argument does not block the possibility of self-directed motion, as in the case of a doctor healing herself, where the mover and moved are the same.

## 1. The Cause and the Effect

Immediately following the Actualities of Motion Dilemma, Aristotle denies three of its premises, at 202b5-21:

> [1] οὔτε τὸ τὴν ἄλλου ἐνέργειαν ἐν ἑτέρῳ εἶναι ἄτοπον ... [2] οὔτε μίαν δυοῖν κωλύει οὐθὲν τὴν αὐτὴν εἶναι... [3] οὔτ' ἀνάγκη τὸν διδάσκοντα μανθάνειν, οὐδ' εἰ τὸ ποιεῖν καὶ πάσχειν τὸ αὐτό ἐστιν, μὴ μέντοι ὥστε τὸν λόγον εἶναι ἕνα τὸν <τὸ> τί ἦν εἶναι λέγοντα ...ἀλλ' ᾧ ὑπάρχει ταῦτα, ἡ κίνησις·
>
> [1] It is not absurd that the actualisation of one thing should be in another. ... [2] There is nothing to prevent two things having one and the same actualisation ... [3] Nor is it necessary that the teacher should learn, even if to act and to acted on are one and the same, provided they are not the same in respect of the account which states their essence ... but in respect to the subject to which they belong, the motion.

This leads directly to the discussion of his own position, which he had already sketched, just before entering the Dilemma, as follows, at 202a13-18:

> Καὶ τὸ ἀπορούμενον δὲ φανερόν, ὅτι ἐστὶν ἡ κίνησις ἐν τῷ κινητῷ· ἐντελέχεια γάρ ἐστι τούτου [καὶ] ὑπὸ τοῦ κινητικοῦ. καὶ ἡ τοῦ κινητικοῦ δὲ ἐνέργεια οὐκ ἄλλη ἐστίν· δεῖ μὲν γὰρ εἶναι ἐντελέχειαν ἀμφοῖν· κινητικὸν μὲν γάρ ἐστιν τῷ δύνασθαι, κινοῦν δὲ τῷ ἐνεργεῖν, ἀλλ' ἔστιν ἐνεργητικὸν τοῦ κινητοῦ, ὥστε ὁμοίως μία ἡ ἀμφοῖν ἐνέργεια
>
> The solution of the difficulty is plain: motion is in the movable. It is the fulfilment of this potentiality by the action of that which has the power of causing motion; and the actuality of that which has the power of causing motion is not other than the actuality of the movable; for it must be the fulfilment of *both*...it is on the movable that it [the mover] is capable of acting. Hence there is one and the same actuality of both' (my translation, slightly modified from Barnes (1982)).

I will first briefly outline Aristotle's solution to the problem of causation before discussing it in detail. Causal interaction consists in the transmission of a form from an agent to a patient. The agent's causal activity consists in transmitting the form, and the patient's activity, which is the causal effect, consists in receiving the form. So, causal interaction results in the actualisation of properties in both objects: the cause in the agent, and the effect in the patient. The actualisation of these potentialities is a physical process facilitating the transmission of the form, e.g. the movements of the sculptor's arms and chisel on the wood. This process is at one and the same time characterised essentially by the natures of the two potentialities, the agent's as agent and the patient's as patient (e.g. sculpting and being carved into shape, heating and being heated, teaching and learning). The two natures of the process are different, interdependent, and asymmetrically realised. Their asymmetry lies in that the activity of the agent is realised in the patient, producing the effect on the patient. The interdependences of the two natures are multifarious, binding them into a complex entity of an underlying physical activity grounding two essential natures, namely the cause and the effect. It is their being essential natures of the underlying activity that makes this a case of a complex entity that is *neither one* entity with two properties, *nor two* entities that are different. This complex entity comes about by the mutual, interdependent actualisation of properties of the two objects which are in causal interaction. The entity itself is the causal bridge between the two objects.

We have already seen that causation is the transmission of form from the mover to the movable, at 202a9-12:

> The mover will always transmit a form … which, when it moves, will be the principle and cause of the motion.

This is the core conception which explains further fundamental features of the Aristotelian account of causation, such as its incompleteness, and its asymmetry. The causal interaction begins with contact between the agent and patient, see 202a5-7:

> For to operate on this, *qua* such, is just what it is to produce change, and this it does by contact, so that it will be at the same time acted upon.

The contact facilitates the transmission of the form from the mover to the movable. But the transmission is a process that takes place in time. While it lasts the transmission has not been completed. The unfolding of the stages of transmission marks the incompleteness of the causal process (e.g. building a structure). The process of the reception of the form by the patient is the causal effect. Once the transmission is completed, the causal interaction is not taking place any more. The agent is not acting on the patient, which now possesses the transmitted form. So the process of realisation of the agent's capacity to transmit the form and the patient's capacity to receive the form is the causal process which lasts until the transmission is completed. The realisation takes place through time, during which period the process is driven by the yet not fully fulfilled potentialities of the agent to transmit the form and the patient to receive it. So the causal process of transmission is actual while these potentialities are being realised, and only before they are fully realised. In that sense the causal process is actual only when the potentialities that drive it are incompletely actualised, see 201b31-33:

> Motion is thought to be a sort of actuality, but incomplete, the reason being that the potential whose actuality it is, is incomplete.

But more important than the explanation of the incompleteness of causation is the role that the transmission of the form plays in selecting the cause, which can inform any account of causation. We already saw that the agent is involved in different motions in the course of the causal interaction, due to the contact with the patient which is necessary for the transmission of the form. All of these motions are required for the effect to occur – if not these particular tokens, at least their functional types. But although all of them can thereby be thought of as belonging to the causal field of this causal act, not all of them, or any arbitrary selection from them, are the cause. Some of what happens to the agent is only the means for the transmission of the form.[201] This distinction between the cause and the means towards its realisation

[201] I would like to make a clarification regarding the motion of the mover. One kind of motion is the one resulting from the mover's contact with the movable, which is required to transmit the form to it. But there is a further type of motion that may be required for the transmission of the form. It may be that to achieve contact at all, or to achieve the requisite contact, the mover needs to move itself, as e.g. in the case of a sculptor or a builder. These motions are neither the transmission of the form, nor the

is already found in Plato's *Phaedo* (99a5-b4).[202] But what Aristotle makes explicit here is the criterion that determines the cause, distinguishing it from the means. The form that is transmitted is the principle and the cause of the motion. Everything else that happens in the process, or even the conditions of its happening, is the means for the transmission of the form. Thus the heat from the fire, or from the match, or from the particle fission, is the cause of the explosion, while such factors as the presence of oxygen, or the striking of the match, or the uncovering of the reactor rods, are the means towards the transmission of the form, or even the generation of the form to be transmitted.

Since the causal interaction is the transmission of the form, at the time of transmission the causal form must be present in the agent not only in actuality, but in a transmissible state. The teacher may possess knowledge, but this does not make her into a teacher until she embodies this knowledge in her lecture that transmits it to the students. The knowledge in her memory is the non-transmissible form, while that in her lecture is the transmissible one. (The memory knowledge is non-transmissible in the sense that the agent must come to posses the knowledge in a different form before it can be transmitted.[203]) But the mover need not possess the form in any way other than in a transmissible state at the time of the transmission. This is the least requirement of possession of the form by the mover. The mover may also possess the form in non-transmissible ways, but this is not necessary for it to be or become a mover. Also, even if it does possess the form in a transmissible state, e.g. the teacher has prepared the lecture, it is not a mover until the conditions are such that they allow the form to be actually transmitted. And finally, even if it possesses the form in a transmissible way, it may not be in the appropriate mode for transmitting it to the type of patient at hand.

---

result of contact with the movable, but the preparation for it. But this does not make them uncaused motions. They are motions that are self-inflicted by the mover for the sake of transmitting the form to the movable. They are part of the mover's plan, if the mover is capable of planning, to engage in a more complex causal activity, e.g. hitting the ball in a game of tennis, which involves component motions. Aristotle does not set them apart here, but they have already been distinguished by Plato (see following note).

[202] See in particular 99b2-4: ἄλλο μέν τί ἐστι τὸ αἴτιον τῷ ὄντι, ἄλλο δὲ ἐκεῖνο ἄνευ οὗ τὸ αἴτιον οὐκ ἄν ποτ' εἴη αἴτιον. In Gallop's translation: 'Fancy being unable to distinguish two different things: the reason proper, and that without which the reason could never be a reason'.

[203] Of course it is the memory knowledge that is transmitted, and in that sense it is transmissible, too, but only by being the origin of the further, transmissible state of that knowledge, which the teacher comes to possess before transmitting it to the student.

The transmissibility of the form is a very significant, and entirely unexplored, feature of Aristotle's theory of causation. There are two aspects of it which I want to remark on, even if there is no space here to expound on them. The first is the context relativity of transmission: since the form must be transmissible to a particular type of object, in a particular type of circumstances, the agent must possess the form in a transmissible state relevant to the type of object and type of circumstances of the transmission. An example is the teacher transmitting the lesson in an oral lecture or in a printed article. The teacher, thereby, possesses the lesson in different ways – in her memory, her lecture, and the article. Two of them are transmissible forms, each fitting the circumstances of transmission. The second feature of the transmissibility of the form is the democracy of transmission: no type of transmission is more privileged than others. This means that no type of possession of the form is more privileged than others. Thus, whether the lesson is in a lecture or in an article, neither is more authentically the teacher's lesson than the other.

The context relativity and the democracy of transmission have important consequences for various theories of Aristotle where causal connections play a significant role. For instance, in the case of perception, in different contexts the surface of the wall may look red, orange or pink, without the surface having changed colours. None of these is more truly the colour of the surface than the others, because what colour is transmitted to the perceiver's experience is relative to the circumstances of transmission. There is no illusion in seeing red or pink, not even if the light shining on the wall is coloured or the perceiver is drugged. These are all colours that the surface transmits in these circumstances to this or these perceiver(s). (Chapter 6 is devoted to the investigation of the ontology of colours.)[204]

The more general question is whether a form that the agent transmits in different contexts remains the same, with only the mode of transmission differing, or whether the form is affected by the mode of transmission. I am inclined towards the latter, which would lead us to a one-to-many relation between a feature of the agent and its transmissible types (or even a many-to-many relation between a family of features and a family of types). But this is an area to be explored elsewhere, not as Aristotelian scholarship but as a potential contribution to current philosophical debates.

[204] For a fuller exposition of this feature of perceptual causation, see also Marmodoro (2006).

A further question that arises is the following: which form possessed by the agent is the cause of the causal interaction, the non-transmissible form possessed by the agent pre-transmission, or the transmissible form that the agent either possesses before, or comes to possess by the time of the transmission occurrence, or even during the time of the transmission occurrence?[205] For instance, in the case of the teacher, is it the non-transmissible knowledge that the teacher already possesses in her memory that is the cause of the student's learning, or the transmissible knowledge embodied in the delivered lecture? Aristotle does not give us a decisive statement on this issue. I believe that he vacillates between the two because the problem is complex and he never addresses it directly.

One question is the one we just addressed – which form is the cause. A further question is whether the non-transmissible and the transmissible forms are the same. In some cases there would be no doubt, as in the case of heat. But in other cases, where the mode of embodiment of the transmissible form gives a different type of presence to the form in the object (like time, in analogue and digital watches), uncertainties arise. In different contexts Aristotle takes different positions on the topic, which also affect the answer to the question of which of the two modes of possession of the form is the cause. For instance, in the case of a human being or a builder, the non-transmissible form seems to play the prominent role. The human form of the particular human being seems to be the only human form that is actually present in the person; it remains unclear whether the human form embodied in the heat of his sperm – which generates the embryo by affecting the menstrual fluids – is an instance of the human form which is actually present in the human being. In this case it seems that the human form of the person (not in the sperm) is the cause of generation of the embryo.[206] Similarly, the form of the house in the builder's mind seems to be the house form present in her, rather than the form of the house embodied in the movements of her arms and instruments while she is building. Thus the form in her mind seems to be the cause of the generation of the building, although there is a sense in which the arm movements are the direct cause. But in the case of

[205] The oral lecture which embodies the knowledge of the teacher comes to embody this knowledge during the course of the transmission, just as the movements of the arms and chisel of the sculptress embody the shape transmitted to the statue.

[206] *Phys* III 2, 202a11-2 'The actual man (ὁ ἐντελεχείᾳ ἄνθρωπος) begets man from what is potentially man'.

teaching, the lecture seems to be the cause rather than the knowledge in the teacher's memory; but the memory knowledge seems to be the one that is actually present in the teacher. However, when we come to Aristotle's examination of secondary properties in the *De Anima* the balance tips all the way in the direction of the transmissible form. In the case of the colour of a surface, he considers the physical properties of the surface of the object in the dark as only the first actuality of colour in the object;[207] this gives the object only the potentiality to have visible colour; the object possesses visible colour in actuality only when it is perceived in the light; see 426a15-26:

> ἐπεὶ δὲ μία μέν ἐστιν ἐνέργεια ἡ τοῦ αἰσθητοῦ καὶ τοῦ αἰσθητικοῦ, τὸ δ' εἶναι ἕτερον, ἀνάγκη ἅμα φθείρεσθαι καὶ σώζεσθαι τὴν οὕτω λεγομένην ἀκοὴν καὶ ψόφον, καὶ χυμὸν δὴ καὶ γεῦσιν, καὶ τὰ ἄλλα ὁμοίως· τὰ δὲ κατὰ δύναμιν λεγόμενα οὐκ ἀνάγκη· ἀλλ' οἱ πρότερον φυσιολόγοι τοῦτο οὐ καλῶς ἔλεγον, οὐθὲν οἰόμενοι οὔτε λευκὸν οὔτε μέλαν εἶναι ἄνευ ὄψεως, οὐδὲ χυμὸν ἄνευ γεύσεως. τῇ μὲν γὰρ ἔλεγον ὀρθῶς, τῇ δ' οὐκ ὀρθῶς· διχῶς γὰρ λεγομένης τῆς αἰσθήσεως καὶ τοῦ αἰσθητοῦ, τῶν μὲν κατὰ δύναμιν τῶν δὲ κατ' ἐνέργειαν, ἐπὶ τούτων μὲν συμβαίνει τὸ λεχθέν, ἐπὶ δὲ τῶν ἑτέρων οὐ συμβαίνει. ἀλλ' ἐκεῖνοι ἁπλῶς ἔλεγον περὶ τῶν λεγομένων οὐχ ἁπλῶς.
>
> Since the *actualities* of the sensible object and of the sensitive faculty are *one actuality* in spite of their *difference between their modes of being*, actual hearing and actual sounding appear and disappear from existence at one and the same moment, and so actual savour and actual tasting, etc., while as potentialities one of them may exist without the other. The earlier students of nature were mistaken in their view that without sight there was no white or black, without taste no savour. This statement of theirs is partly true, partly false: 'sense' and 'the sensible object' are ambiguous terms, i.e. may denote either potentialities or actualities: the statement is true of the latter [since without sight there is no actual white or black], false of the former [since without sight there is potential white or black]. This ambiguity they wholly failed to notice. (My emphasis.)

[207] It is the sense in which a violinist is a violinist while she is writing a letter: she possesses the ability to play the violin in appropriate circumstances.

Here the actual surface properties of a coloured object are only potential colour. The object possesses colour when, and only while it is seen. (See chapter 6). So it is the transmissible form that is the cause of the motion.

I will not explore these questions further, as they would require close examination of many passages, and have gone this far only to sketch Aristotle's vacillation on them. We can retain for our present discussion the claim that the form that is transmitted must be possessed in actuality (either in non-transmissible or transmissible mode, or both), and that it must also be embodied in the object in a transmissible mode at least during the time of transmission. Whether the embodied form deserves to count as an actual presence of the form in the object, or only a potential one; whether the non-transmissible form is the same as, or only potentially, the transmissible form; and whether the cause of the motion is considered to be the one or the other – all these may ultimately depend on the case. Aristotle's vacillation may be his way of allowing leeway to accommodate our fluid intuitions about these issues.

The direction of transmission of the form also determines what the cause is and what the effect. This is particularly important in the cases where the form is possessed only in a transmissible state and only at the moment of transmission.[208] In these cases, both the agent and the patient have the potentiality to possess the form, and both come to possess the form actually only at transmission time. Also each of them is necessary for the other; the agent can be an agent only by acting on the patient, and the patient can be a patient only by being acted upon by the agent.[209] But the direction of the transmission of the form is asymmetric. And due to the causal role of the form, this direction determines which is the agent and which the patient.

Let us revisit the distinction between 'belonging to' and 'occurring in' in relation to the asymmetry of the direction of transmission. The 'actuality of that which has the power of causing motion' (202a14), i.e. the actuality of the mover as a mover, belongs to the mover as subject. But 'it is not absurd that the actualisation of one thing should be in another' (202b6); so, since the mover's power to cause motion is actualised in the movable, 'motion is in the movable' (202a13-14). But the

[208] For example, consider a geometer first solving a problem on the board while lecturing on it.
[209] 'It is on the movable that the mover is capable of acting' (202a17); and 'motion is the fulfilment of the potentiality of the movable by the action of that which has the power of causing motion' (202a13-4).

actualisation of the mover's power as mover consists in the transmission of a form 'which, when it moves, will be the principle and the cause of the motion' (202a10-11); so the motion in the movable is nothing but the reception the form. This is why we gave a sense of directedness, above, to the occurrence of the mover's actuality *in* the movable, understanding it as the motion's being directed *at* the movable: the directedness derives from the transmission of the form to the movable, which is what the motion of the movable is.

## 2. The Causal Connection

What type of entity is the *transmission* of the form from the mover to the movable? There is the actuality of the mover as a mover and the actuality of the movable as movable, both being realised in the transmission of the form from the mover to the movable, which is the motion caused and suffered. How are these three actualities related? The metaphysical account of their relation is Aristotle's answer to the problem of causation. The challenge is to explain the nature of the special bond that connects two objects engaged in causal interaction. The challenge is made harder for Aristotle because he restricts himself to the ontology so far developed in his system, which does not make any provisions for such entities as necessary connections between objects, which later philosophers sought to find in causal interactions. But neither does he question or deny the existence of a bond between the interacting objects. So he has to build the bond from the materials of his ontological warehouse of substances and their properties, which they possess either actually or potentially.[210]

---

[210] Waterlow (1982) also considers the difficulty of the challenge that causation poses for Aristotle, but her analysis of the problem and of Aristotle's solution differs from mine in the following respect. For Waterlow the challenge for Aristotle does not come from the metaphysical problem of how to account for the special bond between cause and effect without introducing ontological entities such as necessary connections. Rather, it comes from the fact that the worldview Aristotle operates with (and the language available to him) seemingly creates a need for a metaphysical justification of a bond between causes and effects that has no place in his metaphysics. Waterlow attributes to Aristotle an 'anthropomorphic' view of causation and change, where 'the point of view of the voluntary agent is one from which the 'halves' [*sc.* agent and patient] already present themselves as distinct' (203), while in fact by his own metaphysical account there are not two distinct 'halves' to causation. 'Aristotle's retention of the language of agency and patiency has nothing to do with any postulation of a mystical (and mythical) transaction tying agent to patient or to its effect in the patient' (200)...'Why should we not regard the artifex and his material as forming, in the change, a concrete organic unity, as if the material were an extension of his own body? What happens in the one and what happens in the other have the same end and are from the same principle (201)... In the change as a concrete unitary event there are not different entities to be agent and patient. The active and passive of the verb, from this point of view, are used of the change itself only derivatively, on the basis of an actual distinction existing only *ante* and *post eventum* (202)...Since there are not two beings to connect, there can be neither problem nor solution about the nature and status of the connection' (202). Waterlow's interpretation of Aristotle's account of causation relies on the reading she offers for *Phys* III 3 which I shall discuss in detail in footnote 26. For the moment I want to register in outline where our interpretations agree and where they disagree. There is agreement in understanding that Aristotle sees agent and patient as enjoying a special type of unity. There is disagreement in the understanding of Aristotle's account of that unity. For Waterlow agency and patiency have the same end and are from the same principle, and this is why they are one. Their relation may be understood in the light of the model of an organic part whole relation 'as if the material were an extension of his [the artifex's] own body' (201). But *contra* Waterlow it is clear from the texts I have commented on so far that agency

Substances move. Aristotle's solution to the causal bond problem is to make the motion of the causally interacting substances the same. Their motion, being one and the same but belonging to both substances, links the two substances together. But here a challenge emerges (202b1-5): how can the motion of the agent be the same as the motion of the patient?

> ἀλλ' ἄλογον δύο ἑτέρων τῷ εἴδει τὴν αὐτὴν καὶ μίαν εἶναι ἐνέργειαν· καὶ ἔσται, εἴπερ ἡ δίδαξις καὶ ἡ μάθησις τὸ αὐτὸ καὶ ἡ ποίησις καὶ ἡ πάθησις, καὶ τὸ διδάσκειν τῷ μανθάνειν τὸ αὐτὸ καὶ τὸ ποιεῖν τῷ πάσχειν, ὥστε τὸν διδάσκοντα ἀνάγκη ἔσται πάντα μανθάνειν καὶ τὸν ποιοῦντα πάσχειν.
>
> It is contrary to reason to suppose that there should be one actualisation of two things which are different in kind. Yet, there will be if teaching and learning are the same, and agency and patiency. To teach will be the same as to learn, and to act the same as to be acted on – the teacher will necessarily be learning everything that he teaches, and the agent will be acted on.

Aristotle does not draw back from his solution in view of this problem, but is led to innovate. He will keep the oneness of the motion, but account for its twoness in a metaphysically novel way, which follows different principles from his established essentialism in his theory of substances.

Aristotle tells us, at 202a14-16, that the motion that is in the movable, brought about by the mover:

> ἐντελέχεια γάρ ἐστι τούτου [καὶ] ὑπὸ τοῦ κινητικοῦ. καὶ ἡ τοῦ κινητικοῦ δὲ ἐνέργεια οὐκ ἄλλη ἐστίν· δεῖ μὲν γὰρ εἶναι ἐντελέχειαν ἀμφοῖν·
>
> is the fulfilment of this potentiality [of the movable as movable] by the action of that which has the power of causing motion [the mover]; and the actuality

---

and patiency have different ends, one being the transmission of the form, and the other the reception of the form. Agency and patiency have different natures, being the realisation of different potentialities which belong to different substances. Yet, causation ties agent to patient through a complex entity, a bond, whose metaphysical structure is not left 'mystical' by Aristotle.

> of that which has the power of causing motion [the mover] is not other than the actuality of the moveable; for it must be the fulfilment of *both*.

The terms translated as 'fulfilment' and 'actuality' are ἐντελέχεια and ἐνέργεια respectively, which are used interchangeably in this context.[211] Clearly, so described, the solution faces the *prima facie* objection we encountered above, that teaching will be the same as learning and that the teacher will learn what she teaches. So Aristotle proceeds to refine his answer by a series of examples. Before examining his examples, I should mention that it is only elucidation by example, rather than a change in the answer, that he offers. This is surprising in view of the fact that, as we shall see, we would have expected his answer to be given using different terminology in view of the clarification he makes. But Aristotle does not change the terminology of his solution, despite the fact that he has the opportunity to do so when he repeats it (at 202b-9) immediately following the discussion of the *prima facie* objection. His solution, enriched by the examples, does avoid the objection, as I shall argue below. But one would have expected a re-description of his solution that did not claim the (objectionable) sameness of the two actualities, which his solution does not require and is in fact misleading for the reader. As we do not get a re-description, we need to conclude that Aristotle is using the terms ἐντελέχεια and ἐνέργεια broadly here, to mean by actualisation the *activity* of the agent and patient, rather than the *natures* of their activities.

Aristotle gives four examples to elucidate his solution to the causal connection problem. He sets up the problem by stating the *explanandum*, at 202a16-17:

> A thing is capable of causing motion because it can do this, it is a mover because it actually does it. But it is on the movable that it is capable of acting.

---

[211] See Gill (1980) for an informed discussion of the etymology of ἐντελέχεια, its possible translations, and the debated issue of its synonymy with ἐνέργεια. Gill devotes particular attention to the textual observation that: 'Aristotle's argument...proves that the ἐντελέχεια of the agent and the patient is one, but in the argument Aristotle does not explicitly claim that motion is the ἐντελέχεια of both'. Gill finds it an 'attractive suggestion' to explain the textual observation thus: 'the claim would be that the ἐντελέχεια of the teacher and the learner is the same but what it is to be that ἐντελέχεια for the teacher is an activity, namely a teaching of the teacher in the learner, and a change in the learner, namely a learning of the learner by the teacher'. But she dismisses this as Aristotle's view in the light of 202b19ff, because she finds no indication of an ontological asymmetry between agency as activity and patiency as change (134-5).

The action of the mover can be realised only by acting on the movable. This requires Aristotle to explain how the mover's capacity is bound up with the movable. Immediately following his statement of the problem, he proceeds to offer his explanation by restating his solution and elucidating it with the first two examples, at 202a18-20:

> ὥστε ὁμοίως μία ἡ ἀμφοῖν ἐνέργεια ὥσπερ τὸ αὐτὸ διάστημα ἓν πρὸς δύο καὶ δύο πρὸς ἕν, καὶ τὸ ἄναντες καὶ τὸ κάταντες·
>
> Hence there is one and the same actualityof both [the mover and the movable] alike, just as one to two and two to one are the same interval, and the steep ascent and the steep descent are one.

The first example is ambiguous. On the one hand the interval from one to two can be taken to be *the same* as the interval from two to one, being either an arithmetical unit of value one, or a geometrical magnitude of value one. On the other hand, the two intervals can be taken to be *different*, such as the positive and negative values of the number one, or vectors with opposite directions. I take the example in the latter way because, as we shall see, the metaphysics of the two intervals require them to have *different essential natures*, as the positive and negative unit values do, or as opposite vectors do; whereas taken in the former way the two intervals are one and the same, *described in two different ways* – from one to two, and from two to one. The ancient and medieval commentators interpret this example in two ways, both of which belong to the one entity-two descriptions family of interpretations. The second example is also ambiguous, between the stretch of land being the same inclined road for both ascent and decent, or there being two routes, the route up or the route down, which, as any bicyclist knows, are not only essentially, but dramatically different!

Ancient commentators vacillate (often indiscriminately) between two readings, staying within the one entity-two descriptions family: either one interval described in two different ways in terms of its end points, or one relation described from the point of view of either *relatum*. I believe that the reason for the commentators' vacillation between the two readings is that at 202b17-9 Aristotle

describes the example, speaking loosely, both as an interval (διάστασις) between two points, and as the relation of either point being distant (τὸ διίστασθαι) from the other, as if they were equivalent ways of formulating the example. Reading the example as one interval described differently in terms of its end points is found e.g. in: Simplicius (446, 31-2); Philoponus (370, 7; 375, 26 – 376, 5); Aquinas (III, 4 [314]). Reading the example as one relation that has two *relata*, and accordingly two descriptions (e.g. the relation of procreation, with father and son as the two *relata*, and 'being the father of' and 'being the son of' as the two descriptions), is found in: Simplicius (439, 34bis-37; 448, 30ff; on this reading of Simplicius see also Luna, 1987: 126); Averroes (92v. I-L; 94r. E; 95r. A); Aquinas (III, 4 [307]; to be contrasted with [314]). The modern commentators do not fall prey to this possible confusion, but yet most of them take the one entity-two descriptions interpretation of Aristotle's examples in *Phys* III 3; for instance see e.g. Ross (1979: 361, 362, 540); Gill (1980: 140; 143); Waterlow (1982: 182, 191); Hussey (1983:69-70).

Aristotle does proceed to offer an explanation of the sameness involved in these examples, at 202a20:

> For these are *one and the same*, although their definitions [λόγος] are *not one*. So it is with the mover and the moved. (My emphasis).

This is important, but not complete. It is important because it blocks the objection that teaching would end up being the same as learning, by stating that they have different essential natures. But if they have different essential natures they are not one and the same entity described in two different ways. Whatever it is that is common between the two intervals or the ascent and descent must have two different definitions. Commentators who read λόγος as 'account/description' rather than 'definition' take the examples to be introducing a common single entity in each case, e.g. unit value one, or the inclined road (or the relation between the extremes). This view is held by the majority of the commentators, ancient and modern ones. I have already discussed the position of the ancient and medieval commentators. I will limit myself here to present two recent and very interesting modern accounts that have been offered for the same entity view; one is by Waterlow (1982) and the other by Hussey (1983: 66). Waterlow (and also Kosman (1975: 514)) in analysing the

analogous case of hearing and sounding) identifies the differently described entity as a single event, a single change that is both teaching and learning:

> His [Aristotle's] argument proceeds on the following assumption: the only reason anyone could have for supposing that being a changer (an actual changer) entails change in that changer, rests on a false view of the difference regarding these (in some given instance, such as teaching and learning) as different concrete events, that one could be misled into thinking that the changer as such undergoes a change. But once it is seen that these are different ways of describing the same event, the problem disappears, leaving only one change, which is to be located in the patient (180).

> The point of crucial importance that Aristotle emphasises again and again…is that X's teaching is not a different concrete event from Y's learning. These are one and the same actuality under two descriptions (182).

Waterlow associates this single event that is the entity to which the two descriptions apply with 'a neutral verb-stem determinable by active and passive voices … we may say (a) that teaching is a predicate of Y as well as of X; and (b) that 'teaching' applies to Y in a determinate form (the passive) which is perfectly consistent with the statement 'Y does not teach'' (182). But this linguistic description of a verb-stem and its two grammatical determinations does not explain or establish that the corelevant ontology is of one event under two descriptions rather than along the two vectors or the two routes ontology.

Hussey, who also holds the one entity-two descriptions view, considers that Aristotle's 'positive argument to show that the changes [of the agent and patient] are the same' may be that "an operation must be something that happens over a period of time, and that if we look at the minimal case of change, in which the agent is completely unaffected, there is 'nothing happening' except the change of the patient. Hence, the operation of the agent must be the change" (66). I do not see the relevance of the change being incremental to whether the agent is affected or not. But since in *Phys* III 3 there is no reference to incremental changes, there appears to be no reason to attribute to Aristotle this argument.

For reasons that will become clear in the discussion of Aristotle's subsequent examples and explanation, I take λόγος here to mean 'definition', by contrast with interpretations which read the examples as involving one entity under two

descriptions. My reading requires that whatever it is that the two intervals or routes share in common is not any familiar entity of the Aristotelian ontology, since it has two different definitions of what it is to be it.

It follows on my reading that when Aristotle says that there is a single actuality [ἐνέργεια] of both the mover and the movable (as there is between the two intervals or the two routes), he must be telling us that the mover and the movable as so related in their activity as to be *one* in some sense, but *not one* in the definitions that describe what each of them does or suffers. What makes the definitions of the vector lines two are opposite directions; but what makes these vector lines one? It is the non-directional interval between one and two that is the same for both vector lines. The interval would not be the same, for example, between vector lines one to two and four to three. Similarly with the uphill and downhill routes; they are different because of their opposed directions but are both the same stretch of land, as opposed to two routes on different sides of the hill that share no common stretch of land. Although these examples and this explanation go some way towards explaining what Aristotle means by claiming that the actuality of the mover and the movable is the same, his position is not as explicit as in the explanation we shall find in his next set of examples, which I now turn to consider.

After the Dilemma Aristotle states his own position, resolving the puzzles encountered in the course of the Dilemma itself. On the issue we are examining here, Aristotle says at 202b10-14:

> οὔτ' ἀνάγκη τὸν διδάσκοντα μανθάνειν, οὐδ' εἰ τὸ ποιεῖν καὶ πάσχειν τὸ αὐτό ἐστιν, μὴ μέντοι ὥστε τὸν λόγον εἶναι ἕνα τὸν <τὸ> τί ἦν εἶναι λέγοντα, οἷον ὡς λῶπιον καὶ ἱμάτιον, ἀλλ' ὡς ἡ ὁδὸς ἡ Θήβηθεν Ἀθήναζε καὶ ἡ Ἀθήνηθεν εἰς Θήβας, ὥσπερ εἴρηται καὶ πρότερον
>
> Nor is it necessary that the teacher should learn, even if to act and be acted on are one and the same, provided that they are not the same in respect of the account which states their essence (as raiment and dress), but are the same in the sense in which the road from Thebes to Athens and the road from Athens to Thebes are the same, as has been explained above.

No doubt is recorded in the modern editions on the expression τί ἦν εἶναι at 202b12; only the two immediately preceding articles τὸν <τὸ> have had a less firm transmission in the manuscripts, as Ross documents in the apparatus *ad locum*: we find only τὸν in **I J**; only τὸ in **E**; neither in **F**. We can easily explain the fact that one or the other article dropped out in the manuscripts transcription process because the two words appear very much alike. Bonitz prints both articles τὸν τὸ as part of the text. Ross chooses to print <τὸ> as a *lacuna* to be completed by sense.

The use of the technical expression, coined by Aristotle himself, for essence, <τὸ> τί ἦν εἶναι, settles the issue as to whether by 'account', λόγος, he means description or definition of nature. This is further supported by his immediate example of things that have the same account, namely raiment and dress. 'Raiment' and 'clothing' are one thing, under two names or descriptions, but with one definition which expresses its essence. In *Topics* I 7, 103a25-7, Aristotle says that whatever is one in essence is one in the primary sense (κυρίως), and indeed we find there the very same example of the 'raiment' and 'clothing' to illustrate this type of oneness:

> κυριώτατα μὲν καὶ πρώτως ὅταν ὀνόματι ἢ ὅρῳ τὸ ταὐτὸν ἀποδοθῇ, καθάπερ ἱμάτιον λωπίῳ καὶ ζῷον πεζὸν δίπουν ἀνθρώπῳ

It follows that the route from Thebes to Athens differs in definition from the route from Athens to Thebes since they are not, as Aristotle tells us, like raiment and clothing. The reference back to what 'has been explained above' is to the passage we just examined, 202a19-20, on the relation of the uphill route to the downhill one that differs in account, λόγος. Hence there, too, Aristotle intends λόγος to be the definition of essence.

But there is further evidence that here λόγος is the definition of essence and not a mere description. This comes in an unexpected metaphysical observation that Aristotle makes immediately afterwards. This observation also makes it evident that Aristotle's aim in the two passages we are examining, in which he says that mover and movable are 'one and the same', or that one 'actuality … must be the fulfilment

of both', or that 'to act and to be acted on are one and the same',[212] is to carve out a sense of *qualified sameness*, a sense different from identity of substances, see 202b14-16:

> οὐ γὰρ ταὐτὰ πάντα ὑπάρχει τοῖς ὁπωσοῦν τοῖς αὐτοῖς, ἀλλὰ μόνον οἷς τὸ εἶναι τὸ αὐτό.
>
> For it is not things which are in any way the same that have all their attributes the same, but only those to be which is the same.

Aristotle must be referring to the attributes of substances, because he uses the expression 'everything which belongs' (ταὐτὰ πάντα ὑπάρχει) to these substances, which excludes the underlying substratum. Furthermore, although he only talks of substances that have the same being (τὸ εἶναι τὸ αὐτό), he must mean by 'being' the whole constitution of such things, namely matter and form.[213] The reason is that if he meant only that these substances would be the same in essential form, the statement would be obviously false; two trees of the same species do not have all their attributes the same. Of course, if he meant that the two substances are the same in form, whether form is essential or accidental, he would be stating a tautology when he claims that such substances would have their attributes the same. We should then take Aristotle to be claiming that things with the same constitution, namely identical things, have the same attributes, and hence are indiscernible – we shall refer to it as Leibniz's Law. Aristotle mentions the indiscernibility of identicals, in order to set it apart from the sameness he is discussing in this passage when he says that 'to act and to be acted on are one and the same' (202b11).

---

[212] See the following passages: ἐντελέχεια γάρ ἐστι τούτου [καὶ] ὑπὸ τοῦ κινητικοῦ. καὶ ἡ τοῦ κινητικοῦ δὲ ἐνέργεια οὐκ ἄλλη ἐστίν (202a14-5); μία ἡ ἀμφοῖν ἐνέργεια (202a18); οὔτε μίαν [*scilicet* ἐνέργειαν] δυοῖν κωλύει οὐθὲν τὴν αὐτὴν εἶναι (202b8-9).

[213] For sameness of individuals there needs to be sameness of number, and hence of matter, not only sameness of essence. As we have seen in chapter 2, Aristotle says in *Met* V 6, 1016b31-6: 'Some things are one in number, others in species, others in genus, …; in number those whose matter is one, in species those whose definition is one, …. The latter kinds of unity are always found when the former are; e.g. *things that are one in number are also one in species, while things that are one in species are not all one in number*' (my emphasis). Matter here has the role of the particularising principle, securing the numerical identity of the individuals. If one attributes to Aristotle a different particularising principle than matter, then that principle must be understood to be evoked in the present passage – 202b14-16.

Although Hussey (1983) takes this passage to be about Leibniz's Law (LL) of the indiscernibility of identicals, he also takes Aristotle to be saying about it here that the indiscernibility of identicals is not unrestrictedly true. Presumably Hussey considers that Aristotle is claiming an exception to Leibniz's Law (LL) in the case of the agent and patient:

> Aristotle's treatment of the indiscernibility of identicals is incomplete', for he 'nowhere specifies a necessary condition for LL to apply, but only a sufficient condition (which is evidently too strong to be also necessary, viz. that LL applies when there is 'sameness in being' (69-70).

But, *contra* Hussey, first, Aristotle does not treat the sameness of the agent and patient as being of the same kind of sameness as that of the identicals, since he says: 'for it is not things which are *in any way the same* that have their attributes the same …' (202b14-15, my emphasis), which differentiates the agent-patient sameness from the case of the identicals. Furthermore, I do not agree that it is *evident* that sameness of constitution is too strong a condition to be necessary for the indiscernibility of identicals. I do take Aristotle to be treating sameness of constitution as a necessary condition for the indiscernibility of identicals, and not to consider the agent-patient sameness as an exception to it, but a different case of sameness from it.

It is a cornerstone of Aristotelian substantial essentialism that if the essences are of different kind, the substrata (at the same time) are different too, e.g. being a wolf, and being a rabbit. But this is not the case with the causal agent and patient, which is why Aristotle is at pains to explain their unique metaphysics. What it is to be an agent is different what it is to be a patient; their definitions are different (202a20, 202b22), and with them their kind (202b1). But what makes the metaphysical situation of agent and patient unique is that although the definitions stating their essence (<τὸ> τἰ ἦν εἶναι, 202b12) are different, 'to act and to be acted on are one and the same' (202b11).

But Aristotle's examples have already prepared us for understanding this statement. There is a kind of sameness that the route from Athens to Thebes has with the route from Thebes to Athens, because these routes are realised on the same road. The line from one to two is realised on the same interval as the line from two to one.

In all such cases, their ground of realisation is one and the same despite their essences being different in kind. Aristotle finally states this explicitly at 202b19-22:

> ὅλως δ' εἰπεῖν οὐδ' ἡ διδαξις τῇ μαθήσει οὐδ' ἡ ποιησις τῇ παθήσει τὸ αὐτὸ κυρίως, ἀλλ' ᾧ ὑπάρχει ταῦτα, ἡ κίνησις·
>
> To generalise, teaching is not the same in the primary sense [κυρίως] with learning, nor is agency with patiency, but that to which those belong [ᾧ ὑπάρχει] [*scilicet* is the same for both], namely the motion [κίνησις]; for the actualisation [ἐνέργεια] of this [teaching] in that [learning] and the actualisation [ἐνέργεια] of that [learning] through the action of this [teaching] differ in definition. (My translation.)

There is disagreement between the interpreters on the translation of this passage. As Hussey (1983: 72) notes, there two ways of understanding the passage:

(i) 'the change in which these things are present, i.e. of which it is true that it is an acting-upon and a being-acted-upon, is the same as being acted upon'

(ii) 'the change in which these things are present, i.e. of which it is true that it is both an acting-upon and a being-acted-upon, is the change'.

The latter (ii) is the way in which the majority of the interpreters, including myself, read the passage (e.g. Philoponus (383, 21-2), Ross (1979: 362), and Gill (1980: 137)). Hussey, though, opts for (i) (1983: 6), and so does Charles (1984: 14). For, Hussey remarks, in (i) the 'extra point is made that 'change is indeed the same in definition as the being-acted-upon (for change has been defined as the actuality of the changing thing)'. Hussey does not develop this point further, but Charles does, as he grounds on these lines his interpretation of the chapter, differing from that of the majority. I shall devote the discussion here to the arguments in support of, and against translation (i), and discuss Charles' interpretation. Both Hussey and Charles acknowledge that on linguistic grounds both readings (i) and (ii) of the passage are equally possible; the reasons why they prefer reading (i) to (ii) are mostly interpretative. Charles (1984: 14-5) says:

> 'I reject this translation (*sc.* the equivalent to Hussey's (ii)) because (a) it gives up the essential connection on which Aristotle elsewhere insists between the process and the suffering (202a14-6, b25-7); (b) it postulates a process which is non-directional (and non-relational) and thus conflicts with Aristotle's general view of the essences of processes as the realisation of goal-directed capacities (201a16-8); (c) the grammar of 202b19-22 seems to require that the clause 'the process is the same in the primary sense' takes over both the notion in the primary sense from b20, and also the grammatical object with which it is the same in this sense: viz. the learning, suffering.'

In answer to (a) I wish to say that it is not true that by taking κίνησις as the ground of the instantiation for action and passion, 'the essential connection…between the process and the suffering' is given up; rather, more than one essential connection is allowed, namely the relation to agency and also to patiency. In answer to (b), in my interpretation, the nature of motion is to be found, not in the underlying physical activity, but in the two beings that this activity grounds, agency and patiency. Neither of its natures is truer of the motion than the other, any more than either direction of the route between Athens and Thebes is truer of the underlying road than the other. Aristotle's definition of change does not favour the one over the other. Change is no more the unfolding actuality of the potentiality of the patient as a patient, than it is the unfolding actuality of the potentiality of the agent as an agent. In answer to (c), I wish to defend my reading of the text on the ground that it is actually the most natural: it takes 'being one in the primary sense' to be retaining the same meaning throughout, and working as a predicate that has as its logical subjects on the one hand teaching and learning (as a pair) and action and passion (as a pair), and on the other hand 'that to which these things belong, namely the underlying process'.

The motion to which teaching and learning belong is the substratum of the two actualities. It is the activity between the two substances, their particular type of interaction, that makes actual both the teaching and the learning. As such, the motion is the actuality of the agent's potentiality to teach and the patient's potentiality to learn (see 202a13-16). It is the fulfilment of both potentialities (see 202a16, a18). Since the two potentialities differ in kind, their actualities differ in kind too.

Because the agent's and the patient's capacities are *essentially different*, the one being the capacity of transmitting the form and the other being the capacity to

receive the transmittable form, the realisation of the two different capacities is also essentially different. Charles (1984: 10; 11; 18) shows on the basis of investigation of various passages of the *Physics*:

> In *Phys* V 4, that a process is one in number only if it is one in essence ...but the essence of each thing is defined when one says what it is to be that thing (1017b21-3). If so, processes are one in number only if the definitions of what it is to be that thing are identical... Aristotelian processes are essentially realisations of given capacities of given subjects: their essential properties include the subject of change and the end point of the type of change (i.e. its goal). They are distinct if they do not share all essential properties...It follows that in III 3 teaching and learning must be numerically distinct processes since they differ in essence.

We are now faced by three actualities, two of which are the third! The actualities of the two potentialities (for teaching and learning) are fulfilled in the interaction, the motion, which is their common actuality. No wonder Aristotle had a difficulty expressing this; terminology let him down.

Teaching causes learning. Neither can happen without the other. The teacher is not teaching if the learner is not learning, and the learner (i.e. 'instructee') is not learning (being instructed) if the teacher is not teaching. These two potentialities can occur only together. Their interdependence is captured by the fact that they are actualised by one and the same activity. Both of them therefore characterise that activity, essentially, which in this case is an instance of teaching and learning. The activity bears the two forms in the way that matter bears the essential form in a substance, being en-formed by it. Only that here, the two forms come together in a package of interdependence; the activity is essentially both teaching and learning.

Neither oneness, nor twoness can be sacrificed. The *oneness* of the activity reflects the interdependent actualisation of the cause and the effect. The *twoness* of the activity preserves the polarity of the causal interaction; causes are born together with their effects. Is there a price to pay for this arithmetical versatility? What is lost is the unity of substance, or the autonomy of subject: neither teaching nor learning can stand on its own, the way substances do; they stand and fall together. Nor do we have quite two subjects, either, since neither is autonomous – changes in the internal properties of the one result in changes in the internal properties of the other, as would

readily follow if the teacher taught a slightly different lesson. Together, they comprise a *new type of entity*, of an ontological status of its own.

The new type of entity – call it a *two-in-one* entity – consists of two essential natures en-forming an underlying activity. The activity supports both natures together because of the relation that these two natures have to each other. They are interdependent in different ways, such as being co-existent and co-variant, which is secured by their mutual dependence on the underlying activity.[214] And of course, the entity itself is further dependent on the two substances to which the two actualised potentialities belong. So the two co-actualised natures make up a non-autonomous entity which is the 'causal connection' between the two interacting substances. The one nature is the agent's actualised potentiality and cause, and the other nature is the patient's actualised potentiality and effect; the two are bound together by interdependencies through their grounding on the underlying physical activity. Thus, for example, the physical movement of the carpenter's hands and chisel on the hard wood constitute the carpenter's carving, and the log's being shaped into a statue.

Hussey offers a very different account of the sameness of the motion of the agent and the patient. He says (1982: 66):

> "What then *is* Aristotle's positive argument to show that the changes [of the agent and the patient] are the same? It might be just that an operation must be something that *happens* over a period of time, and that if we look at a minimal case of change, in which the agent is completely unaffected, there *is* 'nothing happening' except the change-(Intransitive) of the patient. Hence, the operation of the agent must be the change-(Intransitive).'

I do not agree that, because the agent's transitive change of the patient happens over time, within a small period of time the agent does not suffer any change. To put it in Aristotelian terms, some but not all of the form that is being transmitted will be transmitted within a short interval.

Finally, although the same type of dependencies binds together causal and non-causal complexes, e.g. teaching and learning but also the overlapping routes,

[214] Determining the details of the ontological interdependence of the two natures, through their relation to their underlying activity, would take us beyond Aristotle's text into metaphysical considerations which can be built on Aristotle's examples, but which are not to be found explicitly in the text. For an account of the metaphysical structure of the two-in-one entity see also chapter 6 of the repsent work and Marmodoro (2006).

there is a fundamental difference between them. Non-causal two-in-one entities are ontologically autonomous complex entities, such as two opposite overlapping vectors, while causal two-in-one entities are dependent on the substances which they causally unite. So the causal connection is a dependent two-in-one entity, but shares its ontological type with non-causal two-in-one entities.

Having examined the nature of the causal connection between the two substances, I would like to end by commenting on an explanatory remark Aristotle makes regarding the mutual actualisation of the cause and the effect. In describing his own position on the oneness of the actualities of the agent and the patient (202b8-22), where, as we saw, he explains that they share the same substratum, he introduces it by saying at 202b8-10:

> οὔτε μίαν δυοῖν κωλύει οὐθὲν τὴν αὐτὴν εἶναι (μὴ ὡς τῷ εἶναι τὸ αὐτό, ἀλλ' ὡς ὑπάρχει τὸ δυνάμει ὂν πρὸς τὸ ἐνεργοῦν)
>
> There is nothing to prevent two things having one and the same actualisation (not the same in being, but related as the potential to the actual).

Here he is making the same point with which he concludes this section, that what is common between two co-actualised potentialities are not their respective actualities, which differ in kind (e.g. teaching and learning), but their substratum, the underlying activity. The way Aristotle introduces this position is that the potentialities of the agent and patient have one and the same actualisation, not by becoming one thing, not even by realising the same type of being, but by having one and the same activity actualise both of them, underlying them both as potential (substratum) to actual. The actualisation of the agency and patiency, therefore, is related to the two resulting actualities as potential to actual, underlying them both as their common grounding activity. For example, the physical activity of the embroidering hands and needle on the material are related to the embroidering and to the decoration of the material in the way that the wood is related to the statue of Hermes.[215] Thus, although in the Dilemma Aristotle objected to two potentialities

[215] The position is then further refined by the requirement mentioned above, that the movements of the hands and needle on the cloth underlie two actualities at the same time, embroidering and being decorated; while the wood of Hermes underlies only one actuality at a time, first the log and then the statue of Hermes.

having one and the same actuality because teaching would end up being the same as learning (202b1-5), here he is saying that what is the same is only their *actualisation*, *not* their *actuality*. They are two mutually bound potentialities in that they can be actualised only together in one and the same actualisation process. Their respective actualities will characterise the nature of this process in different ways, but the process will be one insofar as the same physical activity realises teaching and learning, or sculpting and being carved into shape. Because of the brevity of the description at 202b8-10, different readings of it can justifiably be given, leading to alternative understandings of the relation between the potential and the actual. In particular, it can be read as saying that the actuality of the patient is the potential for the actuality of the agent, related to it as matter to form.[216] But I have argued that the subsequent explanation Aristotle gives in the same passage, and his examples, support the common underlying activity interpretation.

[216] This is the interpretation suggested by Charles (1984: 15) on the ground of his and Hussey's translation of 202b14-9 (see footnote 31): 'Teaching and learning are numerically distinct, but are one in some sense because the teaching 'belongs to' the learning which 'underlies it'. Because Aristotle identifies the process strictly with the learning (the capacity of the patient: see also 202a14-16; b25-7), there is no non-directional process which underlies both teaching and learning ... The learning in the underlying process which stands to the teaching in a relation akin to that of matter to form, because the latter 'imprints' on the learner the knowledge which he had possessed previously only potentially (202a9-12)'. Hussey finds the following in 202b8-10: "Aristotle has in mind sophistic puzzles such as that about Socrates, who at first unmusical, then becomes musical. The unmusical Socrates is potentially musical, the musical Socrates is 'operating' in respect of musicality. 'They' are one and the same man: yet different, incompatible things are true of the 'two' Socrateses'. Accordingly, for Aristotle 'they' are not one in definition" (p. 72).

### 3. The Actualities of Motion Dilemma

I report here, for ease of reference, the original text in which Aristotle presents the Actualities of Motion Dilemma, at 201a21-b5, and its argument analysis:

> This view has a dialectical difficulty. Perhaps it is necessary that the actuality of the agent and that of the patient should not be the same. The one is 'agency' and the other 'patiency'; and the outcome and completion of the one is an 'action', that of the other a 'passion'. Since then they are both motions, we may ask: in what are they, if they are different? Either (a) both are in what is acted on and moved, or (b) the agency is in the agent and the patiency in the patient. (If we ought to call the latter also 'agency', the word would be used in two senses.)
>
> Now, in alternative (b), the motion will be in the mover, for the same statement will hold of 'mover' and 'moved'. Hence either every mover will be moved, or, though having motion, it will not be moved.
>
> If on the other hand (a) both are in what is moved and acted on-both the agency and the patiency (e.g. both teaching and learning, though they are two, in the learner), then, first, the actuality of each will not be present in each, and, a second absurdity, a thing will have two motions at the same time. How will there be two alterations of quality in one subject towards one definite quality? The thing is impossible: the actualization will be one.
>
> But (some one will say) it is contrary to reason to suppose that there should be one identical actualization of two things which are different in kind. Yet there will be, if teaching and learning are the same, and agency and patiency. To teach will be the same as to learn, and to act the same as to be acted on-the teacher will necessarily be learning everything that he teaches, and the agent will be acted on.

Aristotle refers to the argument as a ἀπορία λογική. Interpreters disagree as to how to understand this characterisation. The way I understand it is closest to Philoponus' reading: 'By 'logical' he means one worthy of logical scrutiny' (*In Phys* 376, 6). Aquinas' and Hussey's remarks are more descriptive than explanatory when they comment, respectively, that: 'the difficulty is 'dialectical, i.e. logical. For there are probable arguments on both sides' (*In Phys* III 5 [309]); and 'the arguments used are of a very general kind' (1983: 67). The main alternative reading of λογική in the tradition, with which I will find myself in disagreement, is reported first by Simplicius ('he calls this verbal…because its plausibility arises only from the words

and it is not supported by the facts', *In Phys* 440, 21-2), and voiced among the contemporary commentators, e.g. by Ross: 'the question is a superficial or dialectical one, turning on the verbal difference between ποίησις and πάθησις' (1979: 540).

In the structured representation of the argument that follows in the next page, the convention I follow is to indent under the conclusion the premises or the sub-arguments that support that conclusion. The premises justifying or objecting to a conclusion are grouped into the same level of indentation. The premises are numbered consecutively to facilitate reference. In parenthesis I indicate which premises I have supplied for completeness in addition to what is found in Aristotle's text.

**C** The realisation of the agent's and the patient's capacities are neither the same nor different (supplied).

**P 1** Because it is impossible that the realisation of the agent's capacity is different from the realisation of the patient's capacity (supplied).

**P 2** Because if the realisation of the agent's capacity is different (in number) from the realisation of the patient's capacity, one of the following disjuncts is true: **(2.1)** either both are realised in the patient; **(2.2)** or both are realised in the agent; **(2.3)** or one is realised in the agent and one in the patient, e.g. the realisation of the agent's capacity takes place in the agent and the realisation of the patient's capacity takes place in the patient. (See 202a25-7; **(2.2)** and **(2.3)** are supplied).[1]

**P 3** But none of the disjuncts is true.

**P 4** Because **(2.1)** is impossible. Namely, it is impossible that the realisation of the agent's capacity and the realisation of the patient's capacity are both in the patient (supplied).

**P 5** Because if the realisation of the agent's capacity and the realisation of the patient's capacity are both in the patient, then both consequences follow: **(5.1)** the agent's capacity will not be realised in the subject that has the capacity, the agent; **(5.2)** the same subject, the patient, will undergo the realisation of two (different) capacities at the same time towards acquiring one form. (See 202a33-6).

**P 6** But **(5.1)** is nonsense (see 202a36).

**P 7** And **(5.2)** is impossible (see 202a36).

**P 8** And *mutatis mutandis* for **(2.2)** (See 202a29-30).

**P 9** And it is impossible that the realisation of the agent's capacity takes place in the agent and realisation of the patient's capacity takes place in the patient (supplied).

**P 10** Because if the realisation of the agent's capacity and the realisation of the patient's capacity are each in each, then one of the following disjuncts is true: **(10.1)** either every agent will also be acted upon; **(10.2)** or the agent, having causal efficacy, will not be causally efficacious. (See 202a28-b1).

**P 11** But **(10.1)** is false, and leads to infinite regress (supplied).

**P 12** And **(10.2)** is false (supplied).

**P 13** And it is impossible that the realisation of the agent's capacity is one and the same with the realisation of the patient's capacity (202a36-b2).

**P 14** Because then agency and patiency would be the same actuality, and so acting and being acted upon would be the same thing. (see 202b2-5 for the example).

**P 15** But it is nonsense that two things different in essence, e.g. the agent's acting and the patient's being acted upon, have one and the same actuality (see 202a36-b2).

**P 16** Because the actuality of something is the realisation of its essence (supplied).

**P 17** The agent's capacity and the patient's capacity are essentially different things (see 202a20 and 201b1).

---

[1] Later translations (the Arab-Latin one), and commentaries (by Themistius and Simplicius) take **(2.2)** to be part of the original Aristotelian text, Simplicius has it as a variant at 202a26: ἢ] ἢ ἐν τῷ ποιοῦντι καὶ διατιθέντι ἢ. Ross (1979: 540), and before him Philoponus (370, 20), comments that 'the fuller reading is the result of a later endeavour to make a formally complete disjunction without regard to the actual course of discussion … Aristotle evidently omits as patently impossible the view that both activity and passivity are embodied in the agent'.

# Chapter 6: The Two-in-One Model in Aristotle's Theory of Perception

## 1. Aristotle's Metaphysical Account of Secondary Qualities

Aristotle's theory of secondary properties is grounded on the metaphysical model for two-in-one entities which I reconstructed in chapter 5. The challenge for the interpreter of Aristotle's theory is how to account for the distinction that Aristotle wants between sound and sounding, and for the relation between sounding and hearing.[217] Aristotle's theory is of interest not only from an exegetical point of view, but to contemporary philosophy too, because he claims realism for the phenomenal properties of secondary properties. By phenomenal properties I mean here, in Shoemaker's words, 'a certain sort of property of objects that are constitutively defined by relations to our experience'. Phenomenal properties are *not* the sensations of red, or of screeching, etc. that the perceiver experiences. For Aristotle they are the properties of objects that resemble these perceptual experiences. Objects, for Aristotle, *are* the way they appear to the perceiver, e.g. red, screeching, etc., but they are such only during the time that they appear such to the perceiver. This does not mean that, for Aristotle, an apple is colourless when not observed. He does recognise that even in the absence of an observer, perceptible objects emanate, and transmit through different physical media, the perceptible forms of colour or sound, etc. But for Aristotle, this emanation of form is sound only in potentiality, not yet fully actualised. It is sound that is not sounding. Aristotle holds that a sound sounds only through its interaction with a perceiver. Sound is actual only when it is sounding for a perceiver, because only then is the sound's phenomenal aspect realised and it is that aspect that is most truly a sounding (rather than the vibrations travelling through the air). But it is not the sound sensation in the perceiver that is the phenomenal property of sounding. Rather, sounding is a property of, e.g., a bell, that resembles the sound sensation of the hearer, and exists in full actuality only while the hearer hears the sound. Sounding requires a hearer as a condition for its realisation. In a sense, *we* are a medium in which the appearance *of* the objects is realised, and in this way the potentialities of their nature come to be fully realised through their interaction with us. Their appearance is not realised in our perceptual experience; it is realised in a

[217] This terminology will be explained in the following paragraphs.

being that is different from the perceptual experience and belongs to the object, not the experience. But that being is multiply dependent on the perceptual experience.

The causal interaction between a bell and a hearer is a single activity in the hearer that constitutes two beings, on the model reconstructed in chapter 5: the one being is the sensation of sounding the hearer experiences; the other being is the correlative phenomenal property of sounding of the bell, which is most truly what sounding is.

In accounting for Aristotle's theory of secondary properties I will be referring primarily to *De An* III 2, 425b26-426a19, which I report here for ease fo reference:

> The actuality of the perceptible and of the perceptual experience is one and the same, although their being is not the same. I mean, for example, the sound in actuality and hearing in actuality; for it is possible that that who has the capacity to hear does not to hear, and that which can produce sounds is not always doing so. But when that which can hear is hearing and that which can produce sound is producing it, then hearing in actuality and sounding in actuality come to be at the same time, and one might call the one hearing and the other sounding.
>
> If then movement, i.e. acting [and being affected], is in that which is acted upon, both sounding and hearing in actuality necessarily are in that which has the capacity to hear; for the actuality of that which can act and produce movement takes place in that which is affected; for this reason it is not necessary for that which produces movement to be itself moved. The actuality of that which can sound is sound or sounding, while that of that which can hear is hearing or listening; for hearing is twofold, and so is sound.
>
> The same account applies also to the other perceptual experiences and perceptibles. For just as both acting and being affected are in that which is affected and not in that which acts, so the actuality of both the perceptible and the perceptual experience takes place in that which can perceive. But in some cases there is a name, e.g. sounding and hearing, while in others one or the other actuality has no name; for, the actuality of sight is spoken of as seeing, but that of colour has no name, while that of that which can taste is tasting, but that of flavour has no name.
>
> Since the actuality of the perceptible and of the perceptual experience is one, though their being is different, the hearing and sounding which are so spoken of are necessarily simultaneously destroyed and simultaneously preserved, and so too for flavour and taste, and the rest similarly; but this is not necessary for those which are spoken of as potential. (My translation).

The passage quoted, however sketchy and at first sight obscure, presents the two-in-one model in its application in Aristotle's theory of perception. Aristotle is here describing the metaphysical relations that link together perceptible forms (that I take to be what we nowadays call secondary qualities such as sounds and colours), the objects which they are qualities of, and the perceptual experiences we have of them. The key philosophical intuition at the basis of Aristotle's metaphysical account of perception is that on the one hand perceptible forms are real in the world as properties of the objects they belong to, while on the other hand they fully realise their nature only when perceived. It is the interaction between the object of perception and the perceiver that brings about both the reality of the perceptible form and of the perceptual experience. Sounding and hearing, in the example given, are so intimately mutually dependent that their reality is one, though what it is for them to be such is different and what each metaphysically belongs to is different. In the passage I am considering Aristotle addresses, or better anticipates, a worry of great interest and concern to contemporary philosophers. This worry, to use Sidney Shoemaker's words, is that 'the identity of what we call secondary properties seems to be in some way bound up with the phenomenal character of our experience of them'. The general framework in which this philosophical issue is embedded is the seeming disparity between (in Sellars' terminology) the so-called 'manifest image' namely the world as we experience it, and the so-called 'scientific image', namely the world as science tells us it is. How the colour one experiences can be somehow part of what scientific theories tell us is out there has become a puzzle, where the challenge is to find a way forward that avoids either: subjectifying secondary properties and construing them as features of sensations (thereby eliminating them from the 'real' world); or objectifying secondary properties and identifying them with whatever physical properties of the objects in the world systematically cause our sensations (thereby eliminating us as a 'real' coefficient in determining what secondary qualities are).[218]

We, and Aristotle well before us, want an account for the redness of an apple as due both to the environment around us, the 'real' world, but also in part to the interaction with us *qua* perceivers. The passage quoted above from the *De Anima*

[218] I have followed Shoemaker (1996) as to how to state the problem.

shows that not only does Aristotle share our puzzlement about what secondary qualities are, but also our *desiderata* for the solution to this puzzle. This is why the solution he provides is heuristically promising, as we shall see in section 2 of this chapter.

Aristotle's position about the ontological status of secondary properties finds its metaphysical basis in the Two-in-One model. This model describes an 'entity' that is too many to be one, and too few to be two. It has a double nature, defined by two distinct sets of (incompatible but interdependent) properties.

The first 'building block' for the metaphysical structure Aristotle is creating is presented in the very first sentence of the passage under examination:

> The actuality of the perceptible and of the perceptual experience is one and the same (425b26-7).

It is the oneness of the actuality of the perceptible, e.g. the sound of a bell, and of the corresponding perceptual experience, hearing. But how can the actuality of sounding and that of hearing be one?

In the sketchy passage in the *De Anima* there is only a hint as to how to provide philosophical justification of their oneness. The hint is given in the claim that the actuality of the two beings is 'in' the perceiver, or more precisely in the sense organ:

> Both sounding and hearing in actuality necessarily are in that which has the capacity to hear (426a3-4).

On the basis of the analogy between this passage and *Phys* III 3, extensively discussed in chapter 5, it is sound to conclude that sounding and hearing *being in* the ear amounts to the their being forms which are instantiated in matter; in this case, the forms are instantiated in the physical activity caused by the vibrations transmitted through the air from the bell onto the sense organ of the ear.

But that the two beings are instantiated in the same substratum certainly generates metaphysical unease: why is it that the two co-instantiated beings do not give rise to two actualities that just overlap in matter? Why does only one actuality arise? To see the reasons against this stance we need to turn to another aspect of the

Two-in-One model, namely the relation between the two beings. This topic has been discussed at length in chapter 5; here I just want to refer back to example of the Athens-Thebes road.

There is a mutual dependence between the form of the road from Athens to Thebes and the form of the road from Thebes to Athens. The reason is that they are both realised on the stretch of path between Athens and Thebes. Any change in the form of the Athens-Thebes road entails a change in the Thebes-Athens road, and vice versa. Similarly for teaching and learning. There is a correlation in content and co-variation between teaching and learning for Aristotle. First, a lecturer in an empty classroom is just speaking, not teaching, since no one is learning. Similarly with a lecturer who is speaking but is not understood by the students. And similarly with a lecturer who is speaking about X but the students take her to be speaking about Y. What is taught is what is learned, and if not learned, it has not been taught. If something different had been taught, something different would have been learned. Thus, too, in the case of hearing and sounding: what is sounding is what is heard; if something different were heard, something different would have sounded.

The mutual dependence for their actualisation, of the roads, of teaching and learning, and of sounding and hearing, entails that what each of the two beings is depends on what the other being is; and neither of the two beings can change without the other changing as well.

Further there is an existential dependence between the two beings, as we find stated in the passage under examination:

> When that which can hear is hearing and that which can produce sound is producing it, then hearing in actuality and sounding in actuality come to be at the same time (425b29-31).

The requirement of co-instantiation of the two beings at the same time establishes a temporal co-extensiveness dependence of each being on the other. Hence, neither of the two pairs can be actualised without the other also being actualised.

I take the correlation in content between the two beings (in virtue of their instantiation in the same substratum), their co-variation, and the temporal co-extensiveness requirement of each being on the other, to be conditions for the obtaining of the Two-in-One model. These mutual dependencies tend to bind the two beings into a single structure. They become like a single form, only complex. But the type of complexity is very important. As we shall see in the following section, they are two essentially different subjects which cannot make up (and belong to) a further single subject. "Being a lung" and "being a heart" are essentially different. But their instantiations are also constituents of a single subject, the particular animal they belong to. This is not the case with our Two-in-One beings: although they come, so to speak, only in pairs, they do not build up a single entity. Rather, they are irreducibly two subjects at the highest level of composition. So, they are a single complex form (due to their interdependence), but a form that is irreducibly two subjects. In so far as they are one form, they contribute to the oneness of the entity. In so far as they are two subjects, they undermine it.

What does it mean for hearing and sounding to be different in being? Why does the model require them to be two in being, despite the oneness of their actuality?

> The being [i.e. what it is to be such for the perceptible and for the perceptual experience] is not the same (426b27).

The difference in being between hearing and sounding, and analogously for the Athens-Thebes roads, and teaching and learning, can be explained in terms of difference in essential properties, in 'what it is to be such', whether 'such' stands for an activity like teaching and learning or a substance like the two roads.

Now, granted, as we learn from the text, that the two beings are essentially different, why could they not be both parts of a metaphysically higher-level being or form, instantiated as a whole in a single substratum? This would make the Two-in-One model unproblematic in Aristotle's theory of substance, as discussed in chapter 1. The question why the two beings do not constitute a single being, in the sense just explained, is challenging, and I can here only begin to tackle it by examining briefly some of its different aspects.

Could the two beings of a Two-in-One entity be in a single subject as its constituents, in just the way that "being toothed" and "being handed" are in an animal? The answer is that they cannot, because we know from the previous analysis of the Two-in-One entity that the two beings in question are instantiated in the same matter, whereas teeth and hands are instantiated in different quantities of matter. The type of beings involved in the Two-in-One model could not possibly be instantiated in different quantities of matter. Consider the roads case: if the two roads Athens-Thebes and Thebes-Athens are instantiated, as it were, in different stretches of paths they are not instances of the Two-in-One model; they are just different roads.

Can the two beings of a Two-in-One entity belong to a single subject in the way that being a grammarian and being a mathematician do, or in the way that being a teacher and being a mother do? This case differs from the previous one in that the question is whether the two beings can constitute the same subject while being realised in the same, not different, matter. The answer is that they cannot, because they possess incompatible properties, such as the opposite directions of the two roads. The two beings of a Two-in-One entity are, as a pair, something like "being round and being square" or "being five foot tall and being seven foot tall". There cannot exist a subject that possesses both beings as realised in the same matter, for the properties of each being would belong to it, which they cannot because of their incompatibility.

Now, one can see the incompatibility of the two beings in the case of teaching and learning, too, since they are opposite achievements. In the case of hearing and sounding the incompatibility is certainly assumed by Aristotle; I would not attempt though to produce an "in principle" argument in support of this assumption of his.

To sum up, 'entities' of the kind like hearing and sounding and the Athens-Thebes roads are characterised by a bottom-up oneness, and a top-down twoness. They start from the same substratum but cannot constitute a single subject.

Let us now turn to examining the nature of the two beings in the *De Anima* application of the Two-in-One model I have being describing so far. Here the two beings are, as we said, a perceptual form (or secondary quality in our terms) like sounding, and the perceptual experience, like hearing.

> It is possible to have the capacity to hear and not to hear, and that which can produce sounds is not always doing so. But when that which can hear is hearing and that which can produce *sound* is producing it, then hearing in actuality and *sounding* in actuality come to be at the same time, and one might call the one hearing and the other sounding (425b28-426a1, my italics).

We have already seen that Aristotle claims mutual dependence and a complete temporal co-extension between the sounding say of a bell, and hearing it. The relation is analogous to the one holding between teaching and learning, where neither happens without the other for Aristotle. It follows that if no one is hearing, there is no sounding. Does this mean that, for Aristotle, there are no sounds if there is no hearing? And similarly for all other perceptual forms? I wish to argue that this is not Aristotle's claim. Aristotle is not identifying sound and sounding. For him the sound is a state of activation of the sounding power of the bell, but not its fullest activation, which is the sounding. The sound can be realised independently of perceivers, while the sounding is realised only through the mediation of a perceiver; yet it is a property of the bell, not of the perceiver.

We can assume that Aristotle holds that sound, or colour, can be realised in the world independently from the perceiver on the basis of polemical passages in which he rejects the opposite view, held by his predecessors.[219] In the continuation of the passage I have quoted in the beginning from the *De Anima*, we read, at 426a21-5:

> But the earlier philosophers of nature did not state the matter well, thinking that there is without sight nothing white nor black, nor flavour without tasting. For in one way they were right but in another wrong; for since the perception and the perceptible are so spoken of in two ways, as potential and as actual, the statement holds of the latter, but it does not hold of the former.

The above passage should be read in connection with another one, a few pages later, where Aristotle says, at 430a16-17 (on which see also the discussion in Chapter 5): 'In a way light makes colours which are potential into actual colours'. On the

[219] Two important passages, in polemical contexts, that are illuminating for Aristotle's position can be found in the *Metaphysics*, but I can here only mention them here because of space limitations: the argument against the Protagoreans in *Met* IV 5, 1010b30-1011a2, and the one against the Megarians in *Met* IX 3 1047a4-5. See also Johansen (1998: 259-63).

basis of the this (and other similar) passages, and bearing in mind the results achieved so far in the metaphysical analysis of the perception case, it is plausible to reconstruct Aristotle's view on the ontological status of secondary qualities in the following terms:

a) An apple in the dark is red, but only potentially (even if in the presence of an observer); its redness is 'dormant',

b) An apple in the light is potentially red, if unobserved; but its redness being in the light is, so to speak, in active state of alert,

a) Finally, an apple in the light, that is being observed, is red in full actuality; its fully actualised redness is just the way it appears red to us.

It is plausible to draw the distinction between (a) and (b) from the second quote just above, and the distinction between (b) and (c) from the first quote just above. Through his doctrine of potentiality and actuality, as we see in the passages quoted above, Aristotle can differentiate sound from sounding, that is sound as heard (or colour from colour as seen) by taking sound as partially actualised potentiality and sounding as its full actuality. The 'earlier philosophers of nature' according to Aristotle were in a way right and in a way wrong in believing that there are no colours in the world unless these colours are perceived. They were right from Aristotle's point of view because secondary properties can be fully realised only when perceived, but they were wrong in thinking that in the absence of a perceiver objects do not have secondary qualities at all.

Against his predecessors' view, Aristotle does attribute some qualities to objects whose secondary properties are not yet perceived, but not quite what we attribute to them. We believe that when the object, say a red apple, is in the appropriate conditions, i.e. in the light, it emits radiations which *are* the fully realised secondary property of redness. Once the apple is emitting the relevant radiations, thereby realising (fully) its secondary property of being red, and these radiations are perceived, then for us further properties of the red apple come to be realised in virtue of the interaction between the red apple and the perceiver. These properties, which we call phenomenal properties, determine the way the red apple appears to us.

But for Aristotle perceptual forms are most real only when realised in the perceiver: so the perceptual form when fully realised is the sounding, not the sound of the bell, or the redness of the apple. The sound, that is what I call in this context the unheard vibrations of the bell, is for Aristotle only an intermediate state in the realisation of a perceptible form. It is so to speak a secondary property in the making, a semi-activated power which will become, when perceived, a fully actualised perceptible form, e.g. a sounding. Sounding, which is a phenomenal property of e.g. the bell, is for Aristotle the most real sound there can be. Phenomenal properties are for Aristotle 'like' our perceptual experiences, and yet different from them. This conclusion can be derived from the analysis given so far of the Two-in-One model. Sounding and hearing, the two beings in ine substratum, are correlated by multiple mutual dependences. As we have seen in the roads case and in the teaching and learning case, their mutual dependence entails that what each of the two beings is depends on what the other being is; and neither of the two beings can change without the other changing as well. This is the sense in which the phenomenal property, sounding, is 'like' the perceptual experience, hearing. Phenomenal properties however are not identical for Aristotle to our perceptual experiences of them (and this is why he is a realist about phenomenal properties). They belong to, i.e. are properties of, the objects of perception. If the phenomenal properties were identical to our sensations they would belong to us, not to the objects of perception. But this possibility is to be dismissed on the basis of 426a6-7:

> The actuality of that which can sound is sound or sounding, while that of that which can hear is hearing or listening.

In the *De Anima* the claim that the two beings, hearing and sounding, belong to two different things, namely the perceiver and the object of perception is just stated. In the *Physics* Aristotle actually argues for the belonging of the two beings to two different things, against a possible misunderstanding of his position about the oneness in actuality of teaching and learning. I have analysed the argument in chapter 5, here I just mention that the objection Aristotle wants to prevent is the following:

To teach will be the same as to learn, and to act as to be acted on – the teacher will be necessarily be learning everything that he teaches and the agent will be acted on (202b3-5).

To which he answers:

Teaching is the activity of a person who can teach, yet the operation is performed in something – it is not cut adrift from a subject, but is of one thing in another (202b5-8).

**2. Can Aristotle's account strengthen *Primitivism*, in the contemporary theories of colour?**

In his paper *Perception and the Fall from Eden*, Chalmers argues that colour properties are not to be found instantiated in our world in the way they are presented in the phenomenology of our experience – namely, as simple primitive intrinsic properties belonging to physical objects; they are to be found instantiated only in a possible world different from our own, which he refers to metaphorically as Paradise lost. Adam is the only one who enjoyed a 'world of perfect living colours' and it was only in the Garden of Eden that when an apple looked red, 'the apple was gloriously, perfectly, and primitively red'. Adam's Fall from Eden has condemned us all to massive delusion in our visual experiences, with objects not instantiating the colour properties we perceive them to have. David Chalmers claims this is our predicament.[220]

Chalmers's arguments are directed against the contemporary view in the debate on the nature of colour held in a variety of versions by Campbell (1993), McGinn (1996) and others, which he calls *Primitivism*, and describes thus (2004a: 169):

> *Primitivism*...holds that colours are certain *primitive intrinsic properties* that are not phenomenal properties or properties of our visual field, but are nevertheless *constitutively connected* to such properties. On this view colours have an intrinsic 'qualitative nature' that is *revealed* in some fashion by colour experiences ... There is a certain phenomenological plausibility [in Primitivism]...but [it] seem[s] to have the counterintuitive consequence that colour experience is massively illusory. When we have an experience as of a red apple, it seems unlikely that the apple itself ... instantiates a simple intrinsic property with a qualitative nature that is constitutively connected to the quality of my visual experience. (My emphasis).

Having unearthed Aristotle's intuition about the ontology of secondary properties I find Primitivism, as described by Chalmers in the quote above, the closest contemporary theory to Aristotle's own one. The strength of Primitivism lies in

[220] All the quotes, unless otherwise specified, are from Chalmers 2004b.

providing an account of colour that respects our intuition about objects being truly coloured as they appear to us – what Chalmers calls its 'phenomenological plausibility'. Its weakness however is its inability to supply a metaphysics which can accommodate sceptical worries such as the ones Chalmers lines up against it. I shall to remedy that weakness drawing inspiration from Aristotle's insight on the matter. For the intuition motivating Primitivism is irresistible. But one also cannot dismiss Chalmers's worries about Primitivism. The position to be set out here therefore endeavors to hold on to the phenomenological plausibility of colours being in the world, while providing a metaphysical account for the claim of a 'constitutive connection' between colours in the world and our experiences of them, an account that can withstand Chalmers's criticism of Primitivism.

Here is how Chalmers chronicles our Fall from Eden. He argues that by eating from the Tree of Illusion Adam learned that 'objects sometimes seemed to have different colours ... at different times, even though there was reason to believe the object itself had not changed'. From Eve's being, by hypothesis, spectrum-inverted relative to him, Adam learned that 'a red apple ... can cause phenomenally red experiences [for him] ... and (in some circumstances) can cause phenomenally green experiences [for Eve], without any change in its intrinsic properties'. This taught him perceptual egalitarianism, since he had no reason to favour as more veridical his perceptual experiences over Eve's. From the experience of hallucination, Adam learned that 'one sometimes has phenomenally red experiences in the absence of perfect redness'. Finally, eating from the Tree of Science he learned that his visual experiences are the result of 'a long causal chain from the microphysics of the [object's] surface through air and brain to a contingently connected visual experience'.

From Chalmers's arguments we are well advised to give up the notion that we are *immediately* acquainted with colours as we were in Eden,[221] in favour of a perceptual causal interaction between the object and the perceiver. There is also reason to question whether colours are *intrinsic* properties of a surface, in view of the possibility of inverted spectrum vision together with perceptual egalitarianism. At the

[221] Chalmers (2004b): 'In the Garden of Eden, we had unmediated contact with the world. We were directly acquainted with objects in the world and with their properties. Objects were simply presented to us without causal mediation, and properties were revealed to us in their true intrinsic glory'.

same time, we reckon that colours are *non-relational* properties. Shoemaker put forward a position that makes the qualitative nature of colour properties in objects relational (Shoemaker 1996: 252-254). This is unsatisfactory because explaining the qualitative nature of the colour red in the apple as a relation is sacrificing the phenomenological given. As others have pointed out as well, when we look at coloured objects, we simply do not see relations (for example, McGinn 1996: 541-542).

Having set these initial constraints, let us now turn to the 'constitutional connection' of the qualitative nature of coloured surfaces to our colour experiences. The position to be put forward here could be called *Constitutionalism*, as it offers a metaphysics for this connection. The aim is an account of objects that allows them to *possess* the colours we see them as having, as their properties, while making these colours as *dependent* on their environment as our every day experience shows them to be. It is not naïve realism about colours that we are after, since this has proven to be too inflexible to accommodate all the colour variations and dependencies of which everyday colour phenomena make us aware. Nor is it dispositionalism about colours, which abandons the central message that colour perception delivers about the world. It is a position that retains the colourfulness of objects, while making the colours of these objects sensitive to various factors in the object's environment.

Sharing some of the Primitivist's phenomenological intuitions, and *contra* Chalmers, the Constitutionalist holds that objects do have surface qualitative natures. Let us call a *sensuous property*[222] of a surface the qualitative character of the surface that according to Primitivism is revealed in a colour experience. On Chalmers's description of Primitivism, "colours have an intrinsic 'qualitative nature' that is revealed in some fashion by colour experiences". Also, Maund says that it is "a 'prime intuition' that colours are represented as qualitative, sensuous features" (Maund 2002). But on account of Chalmers's arguments from perceptual egalitarianism and inverted spectrum vision, and *contra* Primitivism, Constitutionalism does not hold that an object's surface has a single intrinsic qualitative character. Rather, according to Constitutionalism, objects possess surface microphysical properties; these properties interact with perceivers in various

[222] The term 'sensuous' is used without any commitment to the mental. For the legitimacy of this use of the term see Maund (2002).

circumstances; under such conditions they are disposed to ground different qualitative features of surfaces, varying according to the circumstances.

From science we have come to recognise that perception occurs in virtue of a causal interaction between a coloured object and a perceiver. This interaction takes place at the physical level between e.g. a red object and the perceptual system of the perceiver. This *causal interaction* is the ground for the occurrence of the perceptual experience of the perceiver; she sees the red apple. But further, it is a distinctive feature of Constitutionalism that the same causal interaction is also the ground for the realisation of a sensuous property of the red surface. Thus the experience of the perceiver and the sensuous property of the object are *co-realised.*

The apple's surface 'sensuously-reddens' in the world only while interacting with a perceiver. This is the core on which the Constitutionalist builds her account of sensuous properties, responding to Chalmers's criticisms of Primitivism. On Constitutionalism, objects have microphysical surface properties independently of perceivers. Colours are realised only for the duration of the interaction between the microphysical properties and the perceiver. Under normal perceptual conditions, the interaction of a red apple with a perceiver grounds the sensuous property red of the apple's surface. The perceiver's colour experience and the object's sensuous property are distinct from one another, but have co-extensive life spans, sustained by the physical causal interaction between object and perceiver. Thus the apple possesses the colour red when and only when the perceiver has the experience of the red apple in normal perceptual conditions. (Discussion of hallucinations follows, p. 190). When the apple is not perceived, in virtue of its surface microphysical properties it has the disposition to possess the colour red in normal perceptual circumstances.

It follows that a sensuous property is not an experience in the perceiver. If it were, then the object's disposition to cause colour experiences in a perceiver would explain all there is to colour. But there is more to explain about colour than surface microphysics and the object's disposition to cause colour perceptions, as McGinn (1993: 261-262) and Campbell (1996: 540), among others, have argued. The phenomenology of colour requires an ontology of colour to back it up. This motivated the Primitivists, and it also motivates the present account.

So according to Constitutionalism, coloured objects do not appear in full sensuous-apparel all the time. They need specific external conditions to obtain in

order to realise their sensuous properties. It is only in the context of the causal interaction with a perceptual system that an object's surface can realise its sensuous properties. The perceiver's perceptual system, though external to the object, is a necessary realisation-ground for the sensuous properties of the object. To understand this dependence on external conditions, consider a car. It can reach its maximum speed on a flat road surface. The causal interaction between the car and the road is the realisation ground of the speed of the car. The flatness of the road is (in this case) a necessary external condition for the car to realise its speed potential in the course of the causal interaction between car and road. In the case of sensuous properties, a vision system is a necessary external condition for a sensuous property of a surface to be realised in the course of the causal interaction between object and perceiver.

A sensuous property is a property of the coloured object's constitution, despite its dependence on external conditions for its realisation. Let us consider an example of another constitutive property which is grounded on a causal interaction with the environment. When some gas is released into a cubic container, the cubic shape of the volume of gas supervenes on the location of the individual gas molecules which are in causal interaction with the container. This shape of the volume of gas lasts while the gas's causal interaction with the external conditions persists. Yet, the cubic shape is a constitutive property for the volume of gas. In our case, the sensuous property is a *constitutive property* of the object's surface, although it is realised on the ground of, and for the duration of, the causal interaction of the microphysical properties of the object's surface with the vision system of the perceiver.

The dependence of e.g. sensuous red for its realisation on the vision system of a perceiver does *not* make the sensuous property *mental*. For, as Peter Simons writes (1987: 316):

> The concept [of dependence] is modal ... the intended meaning of dependence/independence marks *not a qualitative but a modal-existential difference*: dependent and independent objects exist in different ways. (My emphasis).

Therefore the dependence on the vision system does not require sensuous properties to be mental. The present account leaves open for the time being the question whether sensuous properties are physical, mental, or otherwise. An answer

to that question must be defered to another occasion. Primitivists take colours to be categorially primitive properties of objects – not physical, mental or dispositional.[223]

Nor does the dependence of sensuous properties on the causal interaction between object and perceiver make those properties relational. Reasons were given above for the phenomenological implausibility of a position such as Shoemaker's relational sensuous nature of e.g. red; such a conception of sensuous nature does not bear any similarity to the way we perceive red – i.e. as a monadic property. Sensuous properties are *non-relational*. On the Constitutionalist's account, the sensuous-red of an apple supervenes on the physical causal interaction between the surface of the apple and the perceiver; more accurately, between the microstructure of the surface on the one hand and the perceptual environment on the other, which includes the conditions of the physical environment and the vision system of the perceiver. The causal interaction is of course relational, but its relationality does not transfer to the property at the supervening level. Sensuous red is a monadic property of the surface of the apple grounded on the apple's relation to the perceiver. It is *not* an *intrinsic* property of the surface of the apple, since it rests on the relation between the surface and the (external) perceiver and environment.

Both the experience of the perceiver and the sensuous red of the apple *supervene* on the physical interaction between the apple and the perceiver which grounds them. The two supervening properties/activities (hereafter 'properties' for short) are dependent on the subvening physical interaction for their realisation. But the relations between them (more precisely, among the three of them) are more complex than supervenience can capture. Supervenience itself involves the *dependence* of the supervenient on the subvenient properties which determine them; and the *covariation* of the supervenient properties with their subvenient ones. But this describes only the vertical relations between, on the one hand the experience and the sensuous property, and on the other hand the subvening physical causal interaction. In addition to the vertical relations there are horizontal relations between the two supervening properties (i.e. colour experience and sensuous property); these

[223] For example, McGinn (1996: 548): 'Now we have, in addition to mental or physical properties (and combination thereof), a further set of basic properties that objects may instantiate – the colours.' 'To the old question, "Are colours mental or physical, subjective or objective?", we must answer, "Neither: they constitute a third category, just as real as, but distinct from, mental and physical properties'. 'Colours are primitive properties, not analysable in any other terms: 'red' simply denotes the property of being red, not the property of being disposed to look red' (*ibidem,* 550).

relations are, of course, grounded on the vertical ones. The sensuous property and the experience are horizontally related by co-dependence, co-determination, and co-variation relations between them.

The colour experience and the sensuous property are *co-dependent*, being co-realised in the perceptual process. Their co-dependence is why the experience and the sensuous property have coextensive life spans. In cases of hallucination, no sensuous property is realised since there is no coloured object. In such cases, the perceiver's experience is realised without a sensuous property being realised. Clearly the mechanism and the metaphysics of hallucinations are different from those of perception. The account I am proposing follows the disjunctivist position in allowing for indiscernible hallucinations and perceptions which have nothing in common in their constitution.[224] On the perceptual mechanism, the experience is bound up with the sensuous property in the ways to be described in what follows. On the hallucination mechanism, the experience is independent of any sensuous property.

The colour experience and the sensuous property are mutually qualitatively *co-determined.* The qualitative nature of the content of the experience is co-determined with the qualitative nature of the sensuous red. This relation between the two must be the basis for the Primitivists' claim that the colour experience reveals the qualitative nature of the colour. The physical interaction which grounds both the experience of red and the sensuous red supplies the common foundation for their qualitative co-determination.

Finally there is *covariation* of the experience with the sensuous-property. Their covariation relation is different from their co-determination and co-dependence relations. Neither of these relations entails covariation. Consider the existential dependence of a daughter on her mother, and further, the qualitative determination of the daughter by the mother. No covariation between mother and daughter, in either direction, follows from these relations.[225] The covariation between the qualitative nature of the content of the perceiver's experience and the qualitative nature of the sensuous property is horizontal. Previously we encountered vertical covariation – of

---

[224] E.g. Martin (2004: 37): 'The disjunctivist theory of perception claims that we should understand statements about how things appear to a perceiver to be equivalent to the disjunction that either one is perceiving such and such or one is suffering an illusion (or hallucination); and that such statements are not to be viewed as introducing a report of a distinctive mental event or state in common to these various disjoint situations'.

[225] On the difference in the formal properties of dependence and covariation, see Kim (1999: 546).

the supervening (experience and sensuous property) and subvening (causal interaction) levels.

The Constitutionalist must now address the following two questions: since perceptual experiences can continue (or even start) after the seen object has ceased to exist, can sensuous qualities exist without qualifying any object? Or is the object they qualify not the one we ordinarily take ourselves to be seeing? The Constitutionalist offers the following extended answers.

The horizontal relations presuppose the co-realisation of the sensuous property and the perceiver's experience. Consider now the case where a perceived coloured object has ceased to exist when the perceptual experience occurs. Constitutionalism needs to say to which object possesses the sensuous property that is co-realised with the perceptual experience. Answer: the sensuous property still belongs to the coloured object that has ceased to exist.

The Constitutionalist here follows Williamson in distinguishing between the logical and the concrete sense of 'exist', and in associating property possession with the logical sense of 'exist'. Williamson (2002: 245) writes:

> Whatever can be counted exists at least in the logical sense: there is such an item. Past objects are no counterexamples to the principle that having properties or relations entails existing in at least the minimal sense. 'Trajan does not exist' is true when 'exist' is used in the nonlogical sense of concreteness, not when it is used in the logical sense. ... Trajan now stands in causal and semantic relations to various objects. He still has relations, but does not still exist.

The ('posthumously' realised) sensuous property belongs to the object that ceased to exist, since the object still exists in the logical sense. The object can posthumously causally impact on the perceiver because it still exists in the logical sense. This situation arises only because of the time gap in the transmission of the causal efficacy of the coloured object to the perceiver.

It might be objected that there is no horizontal covariation of the experience with the sensuous property, in view of the possibility of illusion. That is, if one can misperceive a colour, the qualitative character of the content of one's experience must be independent of the qualitative nature of the sensuous property realised. But

according to Constitutionalism, there is no illusion; there are no deviant causal chains in nature. The sensuous properties realised are different in varying perceptual environments even if the microphysical properties of a surface do not change. (The perceptual environment required for a sensuous property's realisation is a combination of the physical environment within which the perception takes place, and the perceiver's vision system itself.) It follows that we should introduce the notion of the sensuous *nature* of the surface of an object, which consists of the set of sensuous properties of that surface, each of which is realisable in different types of perceptual environment.

We do of course distinguish, for pragmatic reasons, between normal and abnormal perceptual conditions. On the basis of this we deem some experiences illusory in so far as the perceptual causal chains are deviant in relation to the normal perceptual circumstances. But it is important to recognise that the everyday sensuous red we see in red apples and roses is *no more* '*the* sensuous nature' of the surface than the sensuous orange[226] we might see looking at the same red apple when perceiving it under the influence of a drug. Sensuous orange is just the sensuous property that is realised when the apple is perceived under such conditions. And sensuous red is just the sensuous property that is realised when the apple is perceived under normal conditions. But there is nothing that privileges normal conditions of our environment and our vision system over other environments or vision systems that might have evolved or might be artificially created. Once we realise that our perceptual system and environment play a role in the realisation of the sensuous property of a coloured object even under normal conditions, then it follows that the only privileges normal conditions may enjoy over abnormal conditions are pragmatic, not related to how things are or are not. So any sensuous property that is realised in a perceptual setup, no matter how atypical, deviant, or abnormal the setup is, is the surface's sensuous property on a par with the property realised under normal conditions. We may suppose that you have inverted spectrum vision; or that you perceive the apple through a deviant causal chain; or that you are a mutation with respect to sensory apparatus in a post-nuclear-war era. (One can readily think of scenarios where you are in the majority, for the sake of vote counting.) All such circumstances realise

[226] A terminological clarification: sensuous orange is the colour of a surface realised when a normal perceiver sees e.g. carrot soup under normal perceptual conditions.

different properties of the surface's sensuous nature. As far as the surface's sensuous nature is concerned, there is egalitarianism regarding the veracity of the various perceptions resulting from these alternative setups.[227] But as far as our pragmatic considerations go, there is the monarchy of the normal perceptual conditions, relegating other perceptions to illusion and the like. The convention of 'a pragmatic' point of reference is not at odds with Constitutionalism.

Finally, it follows from this account that there is no direct causal relation between the sensuous property of a surface and the experience of the perceiver. Yet we do believe that we see the colour of a surface. According to Constitutionalism, both the colour and the experience supervene on the subvening physical causal interaction between the surface and the perceiver. How then do we perceive the colour, if it is not the cause of the experience? The answer is that supervenient phenomena have causal potency even if they are not direct causes of other phenomena. Here the Constitutionalist follows Jaegwon Kim in explaining the causal efficacy of supervening phenomena in terms of the 'causal processes taking place at a more basic physical level' (Kim 2003: 252). On Kim's line of reasoning, when a supervening property/activity S causes another supervening property/activity S*, this is so because S supervenes on a physical property/activity P, and similarly S* on P*, and P causes P*. For Kim, S has in this case a causal role to play with respect to S*, and it is not to be treated as a causally inert epiphenomenon.

The relations in the perceptual case are more complex than this outline suggests. Following Kim, although the supervening sensuous property is not a full-blooded direct cause of the perceptual experience, it is causally relevant for the generation of the experience in that it supervenes on the cause-effect relation between the object's microphysical properties and the perceiver's vision system. In the foregoing discussion we saw that the co-dependent, co-determined, and co-varying sensuous property and experience were grounded on the same underlying conditions of the causal interaction. But this does not clash with the asymmetry of the cause-effect

[227] Chalmers uses an argument from perceptual egalitarianism, but only for normal and inverted-spectrum vision, as opposed to our present extension of the argument to cover illusion as well. Chalmers says that privileging normal versus inverted spectrum vision 'imposes an asymmetry on what otherwise seems to be a quite symmetrical situation. ... The perceptual mechanisms themselves, involving light and brain, seem to be symmetrically well-functioning in both communities ... This view yields a serious sceptical worry: it seems that we have little reason to believe that we are in a community that normally perceives veridically as opposed to non veridically'.

relation of the object's microphysical properties on the vision system of the perceiver. Nor does it clash with the sensuous property qualifying the coloured object and the experience belonging to the perceiver.

To see this, consider the following case. Your desktop is not exerting any force on anything when not pressured. This seems similar to an object which does not have any sensuous properties when unobserved. But when a vase drops on the desktop, two forces are generated from the causal interaction between the vase and the desktop – two forces that counterbalance each other: pressure, and counter-force. What is generated in the course of the causal interaction depends on the make up of the vase and of the desktop (internal conditions), but also on the particular energy distribution in their movements, their orientation relative to each other, etc. (external conditions). Yet the two forces do not supervene neutrally on the physical causal interaction of the vase and the desktop. Rather, they belong to the two objects respectively: the pressure is exerted by the vase and the counter-force by the desktop. Since each object's internal conditions, as well as its respective external conditions (which include the environment, but also the internal conditions of the other) determine how it becomes involved in the causal interaction, why is either of the two forces more the one object's rather than the other's? There seems to be parity of involvement, and so we would expect parity of belonging to the mutual interaction. The reason why the one generated force belongs to the vase and the other to the desktop is the contribution that each object makes to the nature of the generated item. For example, if the desktop had a different make up, given the same external conditions it might have become involved in the causal interaction with deformation or displacement. The counterforce results from the desktop's hardness – external conditions being equal. Had it been made of canvas, deformation would have also resulted. The role of the desktop's make up in determining the nature of the generated item in the causal interaction – the counterforce – anchors the counterforce on the desktop. The counterforce is grounded on the causal interaction, since it depends also on conditions external to the desktop; but it is anchored in the microphysical constitution of the desktop to which it owes its nature – external conditions being equal.

Similarly in the case of colour. It is the make up of the object that determines that, given the external circumstances, it becomes involved with the generation of a sensuous property; while it is the make up of the perceiver that determines that, given

the external circumstances, it becomes involved with the generation of an experience. The role of the object's make up in determining the nature of the generated item in the causal interaction – the colour rather than the experience – anchors colour on the object, despite its dependence on the external circumstances (which include the environment, but also the perceiver's internal conditions). The colour is grounded on the causal interaction as a whole, but it is anchored on the microphysical constitution of the object to which it owes its nature as colour.

The asymmetry of the subvening cause-effect relation enables one to distinguish between Constitutionalism and an epiphenomenal account of colours. The supervening sensuous property acquires its causal relevance in relation to the perceiver's experience from the cause-effect relation at the grounding physical level. Colours are not inert terminal effects of causal routes; rather, their causal relevance derives from the grounding physical causes in the surface microstructure of the object to which they belong.

How Edenic is our world? In Eden there is only one sensuous property associated with a red surface. This is the 'perfect redness' that is instantiated in all red objects whether they are perceived or not. In Eden sensuous red saturates the surface of an apple (behaving like a coat of paint on a surface which excludes at a given time other coats of paint). Sensuous orange cannot find a way onto that surface (without physical change of the surface), let alone all the other sensuous properties of a red surface that may be activated under various perceptual conditions.

But what about our world? According to Constitutionalism, the surface of the apple *is* indeed red, because sensuous red is realised under normal perceptual conditions. Sensuous red and all the other sensuous properties of a surface are not figments of our imagination in a colourless world of science. Which sensuous property is realised on any given perceptual occasion cannot be determined by the microphysical properties of the surface alone, independently of the perceptual environment. And no one of them is genuine to the exclusion of the others, to be revealed to us by our preferred perceptual environment. Different perceptual conditions may obtain, simultaneously or diachronically, thereby enabling the surface of the apple to flash-out its various sensuous properties in different directions to different perceivers at the same or different times. No single sensuous property of a surface saturates the surface of an object.

Here is our world: it has coloured objects, like the red apple. Colours are grounded on the causal activity of the physical micro-structural properties of coloured objects' surfaces. When we see colours, we do not see micro-structural properties; nor do we see dispositions or relations. We see a red or yellow, etc., surface. The qualitative feature of the perceived surface, its redness, yellowness, etc., is one of a set of sensuous properties of the surface which comprise the surface's sensuous nature. Which sensuous properties of the surface we see depends on the perceptual environment. There are multiple dependence, determination, and variation relations among our perceptual experience, the sensuous properties of a surface, and the underlying physical causal interaction between the surface's microstructure and the perceiver's vision system, through the physical environment. None of these relations requires sensuous properties to be mental or relational. When unperceived, our world is like the 'colourless' world of science, because perceptual environments are needed for the instantiation of sensuous properties. But no perceptual environment 'reveals more truly' a surface's sensuous nature than any other. So most of the time, a surface's sensuous nature remains dormant; but when observed, it rises to its full splendour as its multifarious sensuous properties are realised in varying perceptual circumstances.

## Bibliography

### Editions of Aristotle's works

Aristotle, *Metaphysics*. A Revised Text with Introduction and Commentary by W. D. Ross, voll. I-II, Clarendon Press, Oxford 1924.

Aristotelis *Metaphysica*. Recognovit brevique adnotatione critica instruxit W. Jaeger, Clarendon Press, Oxford 1957.

Aristotelis *Categoriae et Liber De Interpretatione*. Recognovit brevique adnotatione critica instruxit L. Minio-Paluello, Clarendon Press, Oxford 1949.

Aristotelis *Topica et Sophistici Elenchi*. Recensuit et brevique adnotatione critica instruxit W. D. Ross, Clarendon Press, Oxford 1958.

Aristotelis *Analytica Priora et Posteriora*. Recensuit brevique adnotatione critica instruxit W. D. Ross. Prefatione et appendice auxit L. Minio-Paluello, Clarendon Press, Oxford 1964.

Aristotelis *Physica*. Recognovit brevique adnotatione critica instruxit W. D. Ross, Clarendon Press, Oxford 1956.

Aristotelis *De Caelo*. Recognovit brevique adnotatione critica instruxit D. J. Allan, Clarendon Press, Oxford 1936.

Aristote, *De la Génération et de la Corruption*. Texte établi et traduit par C. Mugler, Les Belles Lettres, Paris 1966.

Aristotelis *De Anima*. Recognovit brevique adnotatione critica instruxit W. D. Ross, Clarendon Press, Oxford 1956.

Aristotelis *Ethica Nicomachea*. Recognovit brevique adnotatione critica instruxit I. Bywater, Clarendon Press, Oxford 1954 (1ª ed. 1894).

Aristote, *Météorologiques*. Texte établi et traduit par P. Louis, Les Belles Lettres, Paris 1982.

Aristotelis *Fragmenta selecta*, recognovit brevique adnotatione instruxit W. D. Ross, Clarendon Press, Oxford 1955.

**Commentaries on Aristotle's Works**

**Ancient and Medieval Commentaries on the *Metaphysics***

Alexandri Aphrodisiensis *In Aristotelis Metaphysica Commentaria*, ed. M. Hayduk, Berlin 1891.

Alexander of Afrodisias, *On Aristotle Metaphysics 5*, translated by W. E. Dooley SJ, London 1993.

Asclepii *In Aristotelis Metaphysicorum Libros A-Z Commentaria*, ed. M. Hayduck, Berlin 1888.

Averrois *In Aristotelis Metaphysicorum libros Commentarium*, in *Aristotelis Opera omnia cum Averrois Cordubensis commentariis*, Venetiis (apud Iunctas) 1550-1553, vol. VIII, lib. V.

Alberti Magni *Metaphysica*, in *Opera omnia*, tomus XVI, pars I, ed. Geyer, Monasterium Westfalorum 1960, lib. V.

S. Thomae Aquinatis *In Duodecim Libros Aristotelis Metaphysicorum Expositio*, ed. R. Spiazzi, Torin-Rome 1964.

Siger de brabant, *Questiones in Metaphysicam*. Edition revue de la reportation de Munich. Texte inedit de la reportation de Vienne, ed. W. Dunphy, Louvain-La-Neuve 1981.

Siger de brabant, *Questiones in Metaphysicam*. Texte inedit de la reportation de Cambridge. Edition revue de la reportation de Paris, ed. A. Maurer, Louvain-La-Neuve 1983.

Paulus Venetus, *Expositio in libros Metaphysicae Aristotelis*, manuscripts: Casale Monferrato, Biblioteca del Seminario, I. a (3-6), and Pavia, Biblioteca Universitaria, fondo Aldini, 324.

**Modern and Contemporray Commentaries on the *Metaphysics***

Aristoteles, *Metaphysik*. Grundtext, Übersetzung und Kommentar von A. Schwegler, Tübingen 1847.

Bonitz, H., *Commentarius in Aristotelis Metaphysicam*, 1849, reprinted Zurich-New York 1992.

Aristotle, *Metaphysics*. A Revised Text with Introduction and Commentary by W. D. Ross, Oxford 1924.

Aristotele, *Metafisica*. Saggio introduttivo, testo greco con traduzione a fronte e commentario a cura di G. Reale, Milano 1993.

Aristotle, *Metaphysics*. Books IV, V, VI. Translated with Notes by C. Kirwan, Oxford 1971.

Aristote, *Métaphysiques* , *Livre Delta*, Traduction et commentaire par M.P. Duminil et A. Jaulin, Toulouse 1991.

M.-J. Dubois, *Aristote. Livre des acceptions multiples*, Saint-Maur 1998.

Aristoteles, *Metaphysik* VII. Text, Übersetzung und Kommentar von M. Frede – G. Patzig, München 1988.

Aristotle, *Metaphysics*. Books VII and VIII, Translated with a Commentary by D. Bostock, Oxford 1994.

Aristotle, *Metaphysics*. Books XIV and XV, Translated with Introduction and Notes by J. Annas, Oxford 1976.

**Ancient and Medieval Commentaries on the *Physics***

Philoponus, *On Aristotle's* Physics 3 (translated by MJ Edwards), London 1994

Simplicius, *On Aristotle's* Physics 3, (translated by JO Urmson), London 2002

Diels, H., *Simplicii in Aristotelis physicorum libros octo commentaria*, in *Commentaria in Aristotelem Graeca* vol. IX and X, Berlin, IX:1882; X:1885

Schenkl, H., *Themistii in Aristotelis physica paraphrases*, in *Commentaria in Aristotelem Graeca* 5.2. Berlin1900

Averroes, *Aristotelis Opera Cum Averrois Commentariis*, vol. IV, Venetiis 1562-74 (reprinted Frankfurt 1962)

Aquinas, Thomas, *Commentary on Aristotle's* Physics (translated by RJ Blackwell, RJ Spath, WE Thirlkel), Notre Dame 1999

Iacobi Zabarella Patauini *In libros Aristotelis Physicorum commentarii*, Venetiis1601

**Contemporray Commentaries on the *Physics***

Aristotle, *Physics*. A Revised Text with Introduction and Commentary by W. D. Ross, Clarendon Press, Oxford 1936.

Aristote, *Physique* (I-IV e V-VIII). Texte établi et traduit par H. Carteron, Les Belles Lettres, Paris 1952.

Aristotle, *Physics*. Books I and II. Translated with notes by W. Charlton, Oxford 1970.

Aristotle, *Physics*. Books III and IV. Translated with notes by E. Hussey, Oxford 1983.

Aristotele, *Fisica*. Saggio introduttivo, traduzione, note e apparati di L. Ruggiu, Milano 1995.

**Editions of, and Commentaries on, other Aristotelian works**

Aristoteles, *Organon* grece novis codicum auxiliis adiutus recognovit, scholiis ineditis et commentario instruxit T. Waitz, Leipzig 1846, reprinted 1965.

Aristotele, *Organon*. Introduzione, traduzione e note di G. Colli, Torino 1955.

Aristotle, *Categories* and *De Interpretatione*. Translated with notes by J. L. Ackrill, Oxford 1963.

Aristotele, *Le categorie*. Introduzione, traduzione e note di M. Zanatta, Milano 1989.

Montanari E., *La sezione linguistica del* Peri Hermeneias *di Aristotele*, vol. II, Firenze 1988.

Aristotele, *Della interpretazione*. Introduzione, traduzione e note di M. Zanatta, Milano 1992.

Aristotele, *I Topici*. Traduzione, introduzione e commento di A. Zadro, Napoli 1974.

Aristotle, *Topics*. Books I and VIII with excerpts from related texts. Translated with a commentary by R. Smith, Oxford 1997.

Aristotele, *Gli Analitici Primi*. Traduzione, introduzione e commento di M. Mignucci, Napoli 1969.

Aristotle, *Posterior Analytics*. Translated with notes by J. Barnes, Oxford 1975.

Aristotele, *Le confutazioni sofistiche*. Introduzione, traduzione e note di M. Zanatta, Rizzoli, Milano 1995.

P. Moraux, *Aristote. Du ciel*. Paris: Les Belles Lettres, 1965

Aristotele, *De Caelo*. Introduzione, testo critico, traduzione e note di O. Longo, Firenze 1962.

Aristotle, *De Generatione et Corruptione*. Translated with notes by C. J. F. Williams, Oxford 1982.

C. Mugler, *Aristote. De la génération et de la corruption*. Paris: Les Belles Lettres, 1966

Mugnier, R., *Aristote. Petits Traites D'Histore Naturelle*. Paris: Les Belles 1965.

Ross, W. D., *Aristotle. De Anima*, Oxford 1961.

Hamlyn, D. W., *Aristotle's* De Anima. *Books II, III.* Oxford 1977.

Aristotele, *L' Anima.* Introduzione, traduzione, note e apparati di G. Movia, Milano 1996.

Bywater, L., *Aristotelis Ethica Nicomachea*, Oxford 1975.

Aristotele, *Etica Nicomachea.* Introduzione, traduzione e commento di M. Zanatta, Milano 1986.

**Secondary Literature**

Apelt O., *Beiträge zur Geschichten der grieschen Philosophie*, Leipzig 1891, reprinted1975.

Armstrong, D., *A Materialist Theory of the Mind*, 1968.

Aubenque P., *Le problème de l'être chez Aristote*, Paris 1962.

Bonitz H., *Index Aristotelicus,* (reprinted) Darmstadt 1960.

Brentano F., *Von der mannifachen Bedeutung des Seiendes nach Aristoteles*, Freiburg 1862, reprinted 1960.

Broadie, S., 'Aristotle's Perceptual Realism', in J. Ellis, ed. *Southern Journal of Philosophy, Suppl. Vol.* 1993, pp. 137-160

Burnyeat, M., 'Is an Aristotelian Philosophy of Mind Still Credible (a Draft)', in Nussbaum and Rorty (1997).

Burnyeat, M., 'How much happens when Aristotle sees red and hears middle C? Remarks on *De Anima* 2.7-8', in Nussbaum and Rorty (1997).

Campbell, J., 'A Simple View of Colour' in J. Haldane and C. Wright, eds., *Reality, Representation, and Projection*, Oxford 1993.

Chalmers, D. J., 'The Representational Character of Experience' in B. Leiter ed., *The Future for Philosophy*, Oxford 2004a.

Chalmers, D. J., 'Perception and the Fall from Eden', published at http://jamaica.u.arizona.edu/~chalmers/papers/eden.html, 2004b. The hard copy publication is forthcoming in T. Grendler and J. Hawthorne, eds., *Perceptual Experience*.

Charles, D., *Aristotle's Philosophy of Action*. London 1984.

Charlton W., *Aristotle on Identity*, in *Unity, Identity and Explanation in Aristotle's Metaphysics*, edd. T. Scaltsas, D. Charles, M. L. Gill, Oxford 1994, pp. 41-53.

Cherniss H., *Aristotle's Criticism of Plato and the Academy*, New York 1962.

Code A., 'Aristotle's Response to Quine's Objections to Modal Logic', in *Journal of Philosophical Logic* 5, 1976, pp. 159-186.

Crivelli P., 'Aristotle on the Truth of Utterances', in *Oxford Studies in Ancient Philosophy* 17, 1999, pp. 37-56.

Dancy R. M., *Sense and Contradiction: A Study in Aristotle*, Dordrecht-Boston 1975.

Dancy R. M., 'Aristotle and Existence', in *The Logic of Being*, edd. S. Knuuttila, J. Hintikka, Dordrecht 1986, pp. 49-80.

Donini P., *Metafisica. Introduzione alla lettura*, Roma 1995.

Dumoulin B., *Analyse génétique de la* Métaphysique *d'Aristote*, Montreal-Paris 1986.

Ferejohn M., *The Origins of Aristotelian Science*, New Haven-London 1991.

Georgiadis C., 'The Criteria of Substance in Metaphysics V 8, 1017b23-26, Z 3, 1028b33-1029a3, and VIII 1, 1042a24-30', *Bulletin of the Institute of Classical Studies* 25, 1978, pp. 89-91.

Gill M. L., *Aristotle on Substance. The Paradox of Unity*, Princeton 1989.

Gill M. L., 'Individuals and Individuation in Aristotle', in *Unity, Identity and Explanation in Aristotle's Metaphysics*, edd. T. Scaltsas, D. Charles, M. L. Gill, Oxford 1994, pp. 55-71.

Gill, M. L., 'Aristotle's Theory of Causal Action in *Physics* III 3', *Phronesis* 25, 1980

Graham D. W., *Aristotle's Two Systems*, Oxford 1987.

Heath T., *Mathematics in Aristotle*, Oxford 1970.

Hintikka J., 'Semantical Games, the Alleged Ambiguity of 'Is', and the Aristotelian Categories', *Synthese* 54, 1983, pp. 443-468.

Hintikka J., 'The Varieties of Being in Aristotle', in *The Logic of Being*, edd. S. Knuuttila e J. Hintikka, Dordrecht-Boston-Lancaster-Tokio 1986, pp. 81-114.

T. H. Irwin, *Aristotle's First Principles*, Oxford 1988.

Jacobs W., 'Aristotle and Non-Referring Subjects', *Phronesis* 24, 1979, pp. 282-300.

Jacobs W., 'The Existential Presuppositions of Aristotle's Logic', *Philosophical Studies* 37, 1980, pp. 419-428.

Jaeger W., *Studien zur Entstehunggeschichte der Metaphysik des Aristoteles*, Berlin 1912.

Jones B., 'Individuals in Aristotle's *Categories*', *Phronesis* 17, 1972.

Johansen, T., *Aristotle on the Sense-Organs.* Cambridge 1998.

Jones B., 'An Introduction to the First Five Chapters of Aristotle's *Categories*', *Phronesis* 20, 1975, pp. 146-172.

Kahn C. H., 'The Greek Verb 'To Be' and the Concept of Being', in *Foundations of Language* vol 2, 1966, pp. 245-265.

Kahn C. H., *The Verb Be in Ancient Greek*, Dordrecht-Boston 1973.

Kahn C. H., 'Why Existence does not Emerge as a Distinct Concept in Greek Philosophy', *Archiv für Geschichte der Philosophie* 58, 1971, pp. 323-334.

Kahn C. H., 'Retrospect on the Verb 'To Be' and the Concept of Being', in *The Logic of Being*, eds. S. Knuuttila e J. Hintikka, Dordrecht-Boston-Lancaster-Tokio 1986, pp. 1-28.

Kim, J., 'Supervenience as a Philosophical Concept' in J. Kim and E. Sosa, eds., *Metaphysics. An Anthology*, Oxford 1999.

Kim, J., 'Epiphenomenal and Supervenient Causation' in N. Campbell, ed., *Mental Causation and the Metaphysics of Mind*, Broadview Press (2003). (Reprinted from *Midwest Studies in Philosophy* 9 (1984), 257-70).

Knuuttila S., Hintikka J. (eds.), *The Logic of Being*, Dordrecht-Boston-Lancaster-Tokio 1986, pp. 81-114.

Kosman, L.A., 'Perceiving that We Perceive: On the Soul III, 2', *The Philosophical Review*, 84:4, 1975, 499-519.

Kung J., 'Aristotle on "Being is Said in Many Ways"', *History of Philosophy Quarterly* 3, 1986, pp. 3-18.

Leszl W., *Logic and Metaphysics in Aristotle*, Padova 1970.

Lewis F., 'Accidental Sameness in Aristotle', *Philosophical Studies* 42, 1982, pp. 1-36.

Lewis F., *Substance and Predication in Aristotle*, Cambridge 1991.

Loux M. J., *Primary* Ousia. *An Essay on Aristotle's* Metaphysics *VII and VIII,* Ithaca-London 1991.

Lukasiewicz J., Anscombe E., Popper K. R., 'The Principle of Individuation', *Proceedings of the Aristotelian Society*, suppl. vol. XXVII, 1953, pp. 69-120.

Luna, C., 'La Relation chez Simplicius', in *Simplicius, Sa Vie, Son Oeuvre, Sa Survie*, ed. De Gruyter, Berlin 1987, pp. 113-148

Maier H., *Die Syllogistik des Aristoteles*, vol. I, II.1, II.2, Tubingen 1896-1900 (reprinted 1969-1970).

Mariani M., 'Numerical Identity and Predication in Aristotle', *Topoi* 2000.

Marmodoro A., 'La nozione aristotelica di 'per sé': una nuova proposta interpretativa', *Documenti e studi sulla tradizione filosofica medievale*, XI, 2000, pp. 1-34.

Marmodoro A., 'It's a Colourful World', *American Philosophical Quarterly*, 2006, pp. 71-80.

Martin, M., 'The Limits of Self-Awareness', *Philosophical Studies*, 120: 37-89, 2004.

Matthen M., 'Greek Ontology and the 'Is' of Truth', *Phronesis* 28, 1983, pp. 113-135.

Matthews G. B., 'Accidental Unities', in *Language and Logos*, eds. M. Schofield and M. Nussbaum, Cambridge 1982, pp. 223-240.

Maund, B., 'Colour', *The Stanford Encyclopedia of Philosophy*, ed.E N. Zalta, URL = http://plato.stanford.edu/archives/fall2002/entries/colour/, 2002.

McGinn, C., 'Another Look at Colour', *The Journal of Philosophy*, Vol. 93. 1996.

Mignucci M., 'Puzzles about Identity. Aristotle and his Greek Commentators', in *Aristoteles Werk und Wirkung*, ed. J. Wiesner, Berlin-New York 1985, vol. I, pp. 57-97.

Miller F. D., 'Did Aristotle Have the Concept of Identity?', *The Philosophical Review* 82, 1973, pp. 483-490.

Modrack, D., *Aristotle. The Power of Perception*. Chicago and London 1987.

Morison, B., *On Location. Aristotle's Conception of Place*, Oxford 2002.

Noonan, H., *Objects and identity. An Examination of the Relative Identity Thesis and its Consequences*. The Hague/Boston/London 1980.

Nussbaum M., Schofield M. (eds.), *Language and Logos*, Cambridge 1982.

Nussbaum M., Rorty A., (eds), *Essays on Aristotle's* De Anima, Oxford 1997.

Owen G. E. L., 'Aristotle on the Snares of Ontology', in *New Essays on Plato and Aristotle*, ed. Bambrough R., London 1965, pp. 69-95 (reprinted in *Logic, Science, Ontology* ed. Nussbaum M., Ithaca-London 1986).

Owens J., *The Doctrine of Being in the Aristotelian Metaphysics. A Study in the Background of Medioeval Thought*, Toronto 1951.

Polanski R., 'Aristotle's Treatment of Ousia in Metaphysics V, 8', *The Southern Journal of Philosophy* 21, 1983, pp. 57-66.

Preus A., Anton J. (eds.), *Aristotle's Ontology*, Albany 1992.

Reale G., *Guida alla lettura della 'Metafisica' di Aristotele*, Roma-Bari 1997.

Sainati V., *Storia dell'* 'Organon' *aristotelico*, vol. I, Firenze 1968.

Scaltsas T., 'Substratum, Subject and Substance', *Ancient Philosophy* 5, 1985, pp. 215-240 (revised version reprinted in Preus A., Anton J. (eds.), *Aristotle's Ontology*, Albany 1992, pp. 179-211).

Scaltsas T., *Substance and Universals in Aristotle*, Ithaca-London 1994.

Scaltsas T., Charles D., Gill M. L. (eds.), *Unity, Identity and Explanation in Aristotle's Metaphysics*, Oxford 1994.

Scaltsas, T., 'Biological Matter and Perceptual Powers in Aristotle's *De Anima*', in *Topoi* 15, 1996, pp. 25-37.

Scaltsas, T., 'Metaphysical Models of the Mind in Aristotle', in *Philosophical Inquiry* 18, 1996, pp. 31-42.

Schofield M., '*Metaphysics* Z 3: Some Suggestions', *Phronesis* 17, 1972, pp. 97-101.

Sellars, W., *Science, Perception and Reality*, London 1963.

Shoemaker, S., "Self-Knowledge and 'Inner Sense,' Lecture III: The Phenomenal Character of Experience" in *The First-person Perspective and Other Essays*, Cambridge 1996.

Simons, P., *Parts. A Study in Ontology*, Oxford 1987.

Sorabji, R., 'Body and Soul in Aristotle', *Philosophy* 49, 1974, reprinted in Barnes, J., Schofield, M., and Sorabji, R., *Articles on Aristotle. Psychology and Aesthetics*, London 1979.

Stahl D. E., 'Stripped Away: Some Obscurities Surrounding *Metaphysics* Z 3 (1029a10-26)', *Phronesis* 26, 1981, pp. 177-180.

Thompson M., 'Aristotle's Square of Opposition', *The Philosophical Review* 62, 1953, pp. 251-265.

Thorp J. W., 'Aristotle's Use of Categories – an easing of the oddness in *Metaphysica* V 7', *Phronesis* 19, 1974, pp. 238-256.

Trendelenburg A., *Gechichte der Kategorienlehre*, Berlin 1846 (reprinted 1963; Italian edition *La dottrina delle categorie in Aristotele*, Milano 1994).

Waterlow, S., *Nature, Change and Agency in Aristotle's* Physics, Oxford, 1982

Wedin M. V., 'Aristotle on the Existential Import of Singular Sentences', *Phronesis* 23, 1978, pp. 179-196.

White N. P., 'Aristotle on Sameness and Oneness', *The Philosophical Review* 80, 1971, pp. 177-197.

White N. P., 'Identity, Modal Individuation, and Matter in Aristotle', *Midwest Studies in Philosophy* 9, 1986, pp. 475-494.

Wieland W., *Die aristotelische Physik. Untersuchungen über die Grundlegung der Naturwissenschaft und die sprachlichen Bedingungen der Prinzipienforschung bei Aristoteles*, Göttingen 1962 (Italian edition: *La Fisica di Aristotele. Studi sulla fondazione della scienza della natura e sui fondamenti linguistici della ricerca dei principi in Aristotele*, a cura di C. Gentili, Bologna 1993).

Wiesner J. (ed.), *Aristoteles Werk und Wirkung*, vol. I, Berlin-New-York 1985.

Williams C. J. F., 'Aristotle's Theory of Descriptions', *The Philosophical Review* 94, 1985, pp. 63-80.

Williamson, T., "Necessary Existents" in A. O' Hear, ed., *Logic, Thought and Language*, Cambridge 2002.

Witt C., *Substance and Essence in Aristotle. An Interpretation of* Metaphysics *VII-IX*, Ithaca-London 1989.

**Translations of Aristotle's works**

I have used strandard translations throughout.

**Editions of, and commentaries on, Plato's works**

Platonis *Sophista*, recognovit brevique adnotatione critica instruxit I. Burnet, tomus I, Oxford 1979.

Platonis *Parmenides*, recognovit brevique adnotatione critica instruxit I. Burnet, tomus II, Oxford 1979.

Platonis *Timaeus*, recognovit brevique adnotatione critica instruxit I. Burnet, tomus IV, Oxford 1978.

Gallop, David, Plato's *Phaedo*, Oxford 1975